

The IRON AGE

January 22, 1959

A Chilton Publication

The National Metalworking Weekly



With Fewer Independents—

**A New Role
For Auto Industry
Suppliers P. 21**

**Can Scrap Industry
Stage a Comeback? — P. 26**

**Ceramics Take Brunt
Of Extra-Heavy Cuts — P. 61**

Digest of the Week — P. 2-3

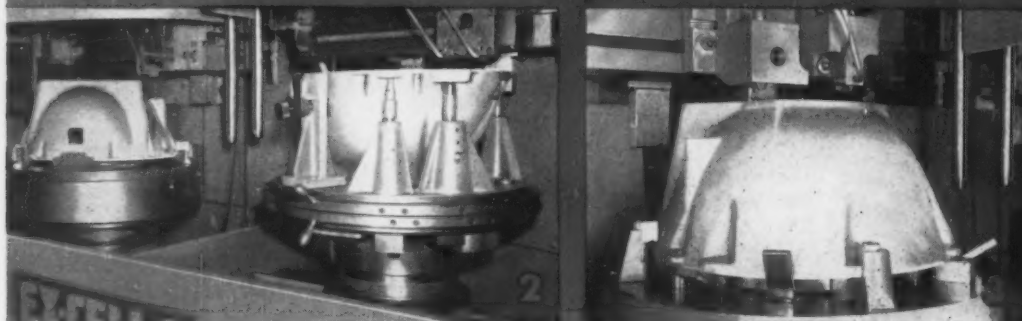


XLO

EX-CELL-O
FOR
PRECISION

An overall view of the Ex-Cell-O Style 432 Duplex Vertical Machine, used for finish facing, boring and chamfering automatic transmission housings.

These are stations #1 and #2 of the first of the three Style 432 machines. Part at left is semi-finish faced, while part at right is finished on the opposite end by two tools each making one pass.



Close-up of housing during the finish face, bore and chamfer operations. Housings are permanent mold aluminum casting.

57-71

Want Higher Production...?

Here's how one auto manufacturer did it

Urged by the upswing in automatic transmission demand, one of the "Big Three" installed several Ex-Cell-O Duplex Vertical Boring Machines. The two-station units rough and finish permanent mold aluminum torque converter housings at a rate of 164 per hour! Automatically, of course. Operations performed by this Style 432: turning, boring, facing, grooving and chamfering, alone, or in any combination.

Perhaps you have a volume production operation you would like to double at no increase in per-unit cost? Then you'll want to find out all about Ex-Cell-O Vertical Boring Machines. Their two-station construction auto-

matically doubles operator output. Get in touch with your local Ex-Cell-O Representative soon. Or, if you prefer, write direct to Ex-Cell-O, Detroit.

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The little booklet on alloy steels that grew into a textbook...

Quick Facts about Alloy Steels appeared for the first time in 1956, as a collection of reprints of a series of Bethlehem advertisements in metalworking magazines.

The small booklet was well received, and we kept adding more of the informative advertisements as we reprinted it to keep up with demand. Today, it has grown to 40-page size, and is in its Third Edition. More than 20,000 booklets have been distributed at the written request of executives, engineers, designers, and others, who have found *Quick Facts* to be an authoritative small textbook on the funda-

mentals of alloy steels. Here's what a U. S. Navy engineer wrote:

"*Quick Facts* is a small textbook of information—a booklet that has been needed for a long time. One of my associates and I had a metallurgical problem involving alloy steels. We just didn't have the information. A friend showed me a copy of your booklet *Quick Facts*, and there on one page, under the subject 'Determining Depth Hardness,' was just what we wanted to know!"

The current booklet contains reprints of the complete series of advertisements, on such subjects as, "What

is an Alloy Steel?" "Effects of Elements," "Grain Size," "Heat-treatment," "Quenching Media," and others. It's written in concise, layman's language, from data compiled by Bethlehem's metallurgical engineers.

Would you like a copy of the *Quick Facts* booklet? Just fill out and send in the coupon.

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January 22, 1959—Vol. 183, No. 4

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First Hollow Cylinder—Bureau of Mines scientists at Albany, Ore., overcame a serious oxidation problem, and the melting of crucibles to cast the first hollow molybdenum cylinder. P. 24

SCRAP INDUSTRY

Problems to Solve—Scrap Institute convention resulted in some



industry soul searching. Conclusions: Better times are coming, but long-term problems must be solved. P. 26

MICHIGAN RULING

Workers Collect—The Michigan State Supreme Court has ruled that workers are entitled to unemployment compensation if their plant is closed because of a strike in another state, as long as they aren't struck. P. 29

LOCAL TAXES

Increases Likely—New or increased state and local taxes can

Metalworking



hit business hard this year. Many communities need money and tax action is expected. P. 35

VETO POWER

Widens its Scope—Senators Byrd and Bush want to give Ike the power to veto only parts of money bills instead of treating them as a package as the law now demands. There is strong opposition. P. 41

FEATURE ARTICLES

CERAMIC TOOLS

Take on Big Job—Ceramic cutting tools, ingeniously cushioned against shock by thin bits of aluminum foil, have tripled the stock-removal rate on one of the toughest machining jobs: Rough turning alloy steel forgings for 120 mm tank guns. P. 61

X-RAY INSPECTION

Mobility Counts—Mounted on a mobile carriage, large tank weldments are now inspected more efficiently and in far less time. The X-ray unit rides on a boom exposing three lines of weldments simultaneously. The setup handles the job in 35 minutes compared to 3 hours formerly. P. 64

PIERCING PUNCHES

How to Reduce Breakage—Small punches break easily. It pays to be aware of the causes of breakage and ways to prevent it. The smaller

sizes need extra support. Varied punch bottoms prevent slug lifting. Accessories help extend punch life. P. 66

TWO NEW SUPERALLOYS

For Elevated Temperatures—Two high-temperature superalloys for aircraft gas turbine applications are gaining widespread interest. One has an iron-nickel-chromium base. The other is an iron-manganese-chromium base alloy of low alloy content. P. 70

CAST FORMING ROLLS

Get Long Service—Savings in machining time and extra long service far outweigh the extra cost of casting tool steel rolls. P. 72

MARKETS & PRICES

JAPANESE PLATE

Sold to the U. S. Navy—Since September Navy buyers have ordered 5700 tons of ship plate and sheet made on mills in Japan. The Japanese suppliers underbid American mills up to \$45 a ton. P. 27

NEXT WEEK

SPRAY BRAZING

Opens Design Areas—It's a simplified process ideal for joining in hard-to-reach places. Next week's technical feature tells how it leads to smaller, lighter, and more efficient heat exchangers for refrigerating equipment.

AUTO PARTS MARKET: Razing of the former Hudson Motor Car Co. illustrates problems faced by auto parts suppliers in a changing market. This week's Special Report points out "Why Auto Parts Suppliers Face Stiffer Competition."

P. 21

FOUNDRIY SALES

Gains Expected—Both gray iron and malleable foundries are confident orders this year will top '58 results. But they are still driving for wider markets with a full arsenal of sales weapons. P. 28

AUTOMAKERS AND SMOG

Warning From the West—Auto producers are warned by Los Angeles mayor that new models must be de-smogged or they will be barred from sale in Calif. P. 37

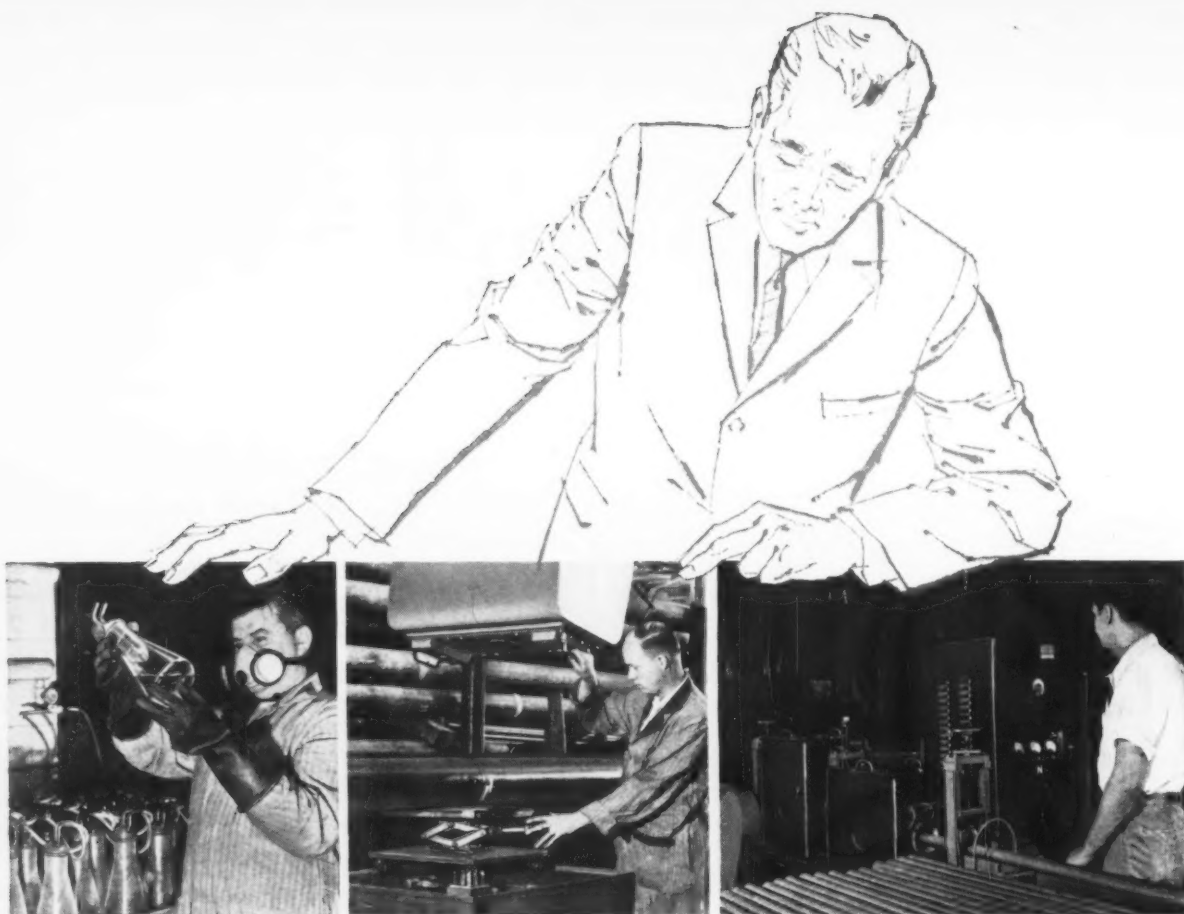
STEEL BUILDUP

It's Gathering Steam—The big steel buildup is gaining strength. Some mills report orders are coming in faster than shipments. Order backlogs are mounting. P. 99

PLATE HEDGING

Buyers Worry About Strike—Plate users want to place tonnages ahead of any pre-strike 'stampede in buying. Some are extending their order lead time by 30 days or longer. P. 100





B&W Quality-Controlled Tubing

is matched to the application

From raw materials to finished tube, quality depends upon control and "know-how." And when it comes to matching the one right tube, of the hundreds of possibilities, for a particular end use application, it takes specialized equipment and experienced technicians.

For instance: If corrosion is a problem — will a steel with a particular heat treatment do the job? If the tube is unusually long and center welding is employed to achieve length — is the joint completely satisfactory? If the tube must have a special soundness quality — is it free from hidden or invisible defects?

These are but a few of the quality control checks which insure that the tubes you buy from B&W are as near perfect in terms of performance as it is possible to make them. When you need stainless, carbon or high alloy tubing — for pressure or mechanical applications — you can rely on Mr. Tubes and B&W to supply the best. Write for bulletin TB-420 — The B&W Quality Control Story. The Babcock & Wilcox Co., Tubular Products Division, Beaver Falls, Pa.



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Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals.



SUCCESS STORIES

B.F. Goodrich distributors helped these customers cut costs. Can they help you?

Bang, rattle, shake

At a Kansas zinc plant, expensive metal pipes were cracking up after a few months' service. They carry hot acid at 400 gallons a minute. But vibrations from the powerful pump shook the pipes until they banged and rattled, gradually cracked, leaked corrosive acid.

The plant superintendent, working with a B.F. Goodrich distributor, decided to replace a short length of lead pipe between the tank and pump with a B.F. Goodrich Flexseal Connector. This is a special kind of hose, made of thick, resilient rubber, which is designed to absorb the pump vibrations traveling along pipelines.

At a cost of only \$105, this B.F. Goodrich hose saved the company \$1,000 in the first year by eliminating the harmful shaking that caused broken connections, frequent repairs, costly pipe replacements. Even greater savings will be made because the sturdy, acid-resisting hose is expected to last another two years.

That's oil, brother

A manufacturer of building materials was looking for a longer-lasting conveyor belt to carry hot, oily pieces of grit. The type of belt previously used had to be replaced every four to six weeks. About two years ago, a B.F. Goodrich distributor sold them a "Superoilproof" conveyor belt. It's still in service, looks good for at least two years more.

Stock situation

A glass company needed supports for a mixer weighing 26,000 pounds. B.F. Goodrich Vibropads, rubber pads for use under machinery, could have been specified, but the customer couldn't wait for shipment from Akron. The B.F. Goodrich salesman working with his distributor stuck his neck out and recommended B.F. Goodrich "Armorite" sheet rubber, usually used for chute linings, conveyor skirt boarding and other places where extra toughness in rubber is needed. The distributor had the Armorite in stock; it was cut, mounted like Vibropads, and the problem was solved.

On the paper route

Pulp-and-paper companies in the far west needed belts only 2½ inches wide to hold stacks of dry pulp and paper on large cutting machines. Each machine needs 30 to 47 belts, usually about 24 feet long. A B.F. Goodrich distributor in Hoquiam, Washington, solved the problem by cutting a 30-inch sheeting belt to the narrow widths, then spliced the belts to make them endless.

Keeping posted

A purchasing agent for a west coast steel company, answering a letter from a B.F. Goodrich distributor about new B.F. Goodrich products, said, "Your letter . . . is an excellent way to call our attention to new developments . . . As you undoubtedly know, the value-

analysis program . . . requires that we conduct a continuous search for new and better products which can perform their function better for equal or less cost. This does not mean, however, that the initial cost will always be lower."

If you would like to know about these new products, ask your B.F. Goodrich distributor, or write to the address given below.

Hose sorry now?

A paper-box manufacturer, in West Virginia, returned a piece of steam hose to his distributor with the complaint that it had lasted only 5 weeks on battery molding presses. He said other B.F. Goodrich hose had lasted 50 months in similar service and was still in use. B.F. Goodrich men were mystified until technical men examined the returned hose and found that it had not been made by B.F. Goodrich at all. Customer explained that a workman must have misidentified a piece of competitive hose, and told distributor that BFG "Burstproof hose" would be used in the future.

New products

Acid hose. New "Commander" acid hose, developed by B.F. Goodrich, handles highly corrosive acids and chemicals that eat holes in ordinary rubber hose. New rubber compound provides high resistance to strong oxidizing acids, such as concentrated sulphuric acid, nitric acid and chromic acid. Sizes from ¾" to 20".

Rubber buckets. B.F. Goodrich rubber buckets are now being made with stainless steel handles, locked into the buckets with stainless steel clips. Handles can't pull off.

New handbook

V belt maintenance. 12-page illustrated manual, "How to get longer life from V belt drives" tells how V belts work, how to select V belts that fit, how to install them, how to keep them running, and how to spot trouble.

For more information

For full information about any product on this page, see your B.F. Goodrich distributor or write B.F. Goodrich Industrial Products Co., Dept. M-495, Akron 18, Ohio.

B.F. Goodrich
industrial
rubber products



How to make a noisemaker pipe down—see "Bang, rattle, shake"

A new problem facing steel users today

The danger of losing money by relaxing inventory controls

When the slump set in last year, big inventories were one of the toughest problems for most companies.

Now, as the economy swings back, these problems may seem to have disappeared. Actually, the problems of inventory cost and risk are always with us—just as much a threat to profit in good times as in bad.

But with the urgency of strict economies reduced, there is a very real danger that many companies will be caught off guard—a danger that recession-born practices will be abandoned as temporary emergency measures without careful enough analysis of their profit potential.

For example, companies that modified their steel inventory policies to avoid long-term commitments found that many costs were reduced and their needs better served. By taking advantage of the stocks offered by steel-service centers, these companies were able to release working capital for more productive purposes, free valuable storage space, reduce handling costs and lower scrap losses, insurance, taxes, etc.

Proof in dollars and cents

Those who carefully weighed all the advantages found reason for a *permanent* modification of their previous buying practices. They proved to themselves that they could and should rely

much more heavily on steel-service centers because it makes sense in dollars and cents.

This conclusion is especially sound when you consider the unusually broad scope of Ryerson stocks and the speed and dependability of Ryerson services. Any kind, shape and size of steel can be shipped to you from Ryerson in a matter of hours. And your steel can be furnished in ready-to-use form, saving time and initial-cutting cost. You gain complete flexibility to meet quick shifts in production schedules. And you have the added assurance of getting steel of uniform, high quality—the unequalled dependability of Ryerson *certified* quality.

Your Ryerson representative is well qualified to review the facts and help you get the maximum value for your steel buying dollars. Ask him to analyze your requirements with you the next time he calls.

What it costs to carry inventory

IRON AGE magazine says: "A survey of eight plants shows that, for every \$100 worth of materials bought, the average yearly inventorying cost is \$19.37."

Other authorities say the real cost of steel placed in inventory for extended future use may be as high as 40% more than the invoice price.



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We and the Russians

Let Us Not Be Luniks

As usual, many Americans—high and low—are falling for the soft soap spread about recently by Mr. Anastas I. Mikoyan. Maybe some will soon be calling him Mike, thus making everything right with the world.

The picture that unfolded as this astute old bolshevik charmed our business people, our actors, and our publicity seekers smacks of the early 30's. Then there was a reawakening in Russian friendship followed by a diplomatic recognition. This was followed by a long list of reneging on agreements, by power grabs, and by imperialistic moves by the Reds.

We can't blame Mr. Mikoyan if a lot of people who ought to know better act like babes in the woods. There is nothing wrong with putting out the carpet for the Russian mouthpiece. He has done a good selling job but he had help from our naiveness.

There are a few simple things for us to remember in dealing with the Reds. Russia is ruled by an iron dictatorship. The people do as they are told by the State.

We are in the midst of a struggle between communism and our type democracy. This fight

extends to trade, to minds, to expansions, to agreements, to allies, to science—and possibly (we hope not) to war.

Now that the United States is strong and capable of protecting herself and helping her allies protect themselves, we can afford to be less jittery. But we can't be relaxed to the point where we actually give the Reds what they are prepared to fight for.

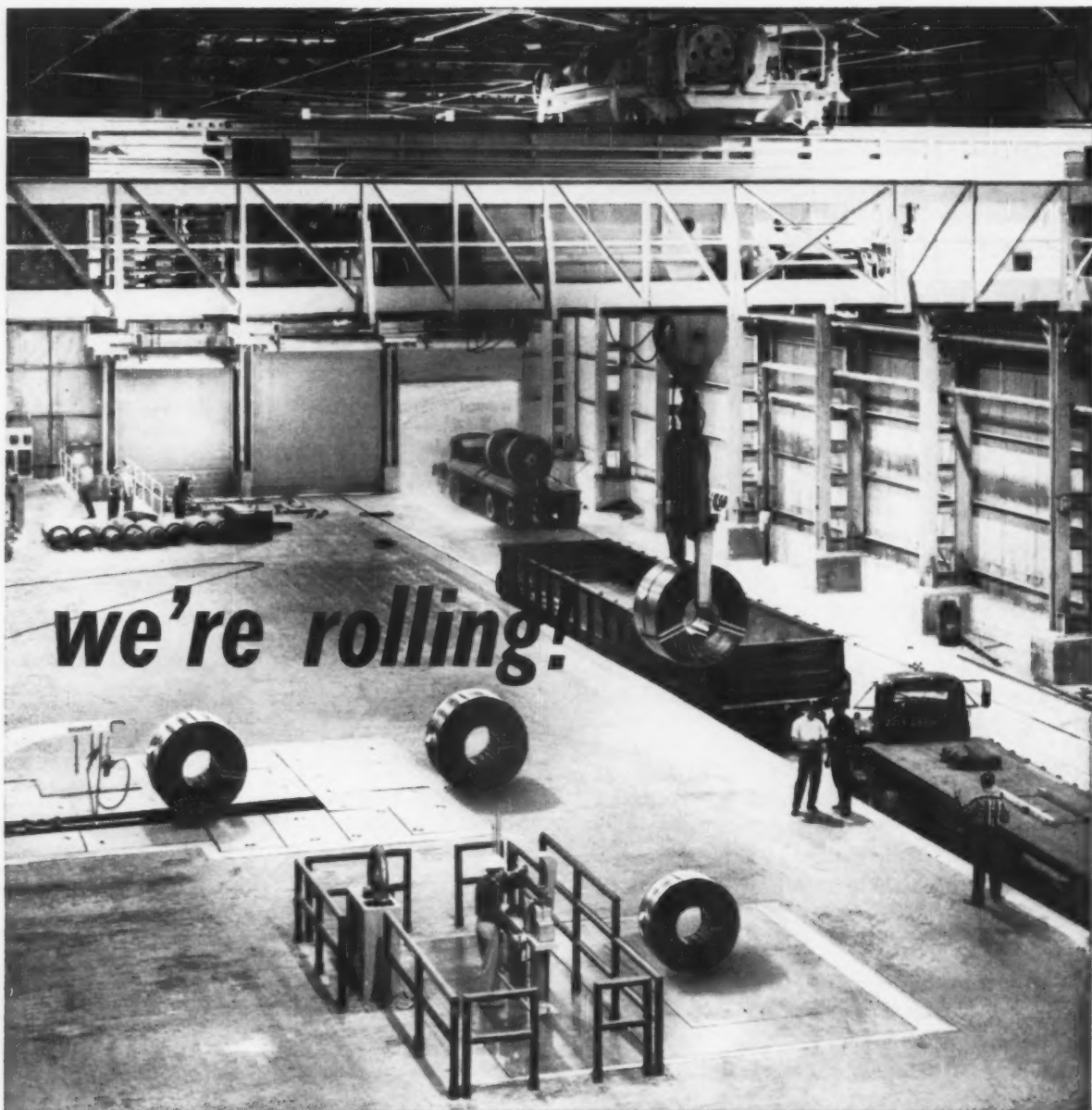
The expansion pattern of the Czars has been adopted under a new banner by the Reds. Everything is directed toward the goal of world rule. We and our allies have no such goal. Thus all the talk about coexistence, friendship, peace, etcetera, is propaganda. We must keep our eyes, ears—and minds—open.

It may help our people to see more of the Russians. But it won't cause them to adopt our way of doing things. It won't hurt to sell Russia non-strategic items but the truth is that if we do, it will produce something the Russians want and need without benefit to us.

Let the Luniks fly out in space. Let us keep a cool head about us. Let's not mix our genuine good naturedness with Red deception.

Tom Campbell

Editor-in-Chief



NOW...AT INLAND...500,000 ADDITIONAL TONS CAPACITY FOR COLD ROLLED SHEET PRODUCTS . . . a half-million more tons of the same uniformly dependable steel that has made *Inland Quality* the recognized standard among manufacturers throughout the great Midwest. Inland's giant, new 4-stand tandem mill, most powerful of its size in the industry, is part of Inland's program of expansion, keeping pace with the growth of Midwest manufacture. New pickling, continuous normalizing, annealing and tempering facilities do their part in producing this quality steel for your use. This new capacity means better service for you from Inland.

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*Division

Pushing Precision Frontiers

By 1960 the international meter may be defined in terms of Krytron 86. Linear devices, calibrated to one-ten-millionths of an inch, can then permit production line tolerances of one-hundred-thousandths of an inch. Research is studying practical means of measuring other frontiers of measurement, such as extremes of temperature in the million degree range.

Honeycomb Machining

A new high-speed process for machining honeycomb cores of stainless steel or aluminum uses a series of arcs of short duration. The unit's electrode wheel strikes 2500 arcs per second. The method is said to work 12 to 30 times faster than electrolytic machining. Most effective cutting is done using an electrolyte solution as a coolant. Best application is for rough cuts.

Dielectrics Bond Plastics

A dielectric setup generates 14 million cycles per second at high voltages to direct heat for bonding plastics. Developed for vinyl automotive trim, the new method shows promise for bonding and decorating a wide range of soft materials. Texturing and embossing are made simple.

Tumbling Ups Fatigue Limit

Results of research show that uniformly compressive stresses are caused by tumbling stress-free specimens. Maximum compressive stress is at the surface, diminishing to zero a few thousandths of an inch deep. Similar results are reported for specimens with grinding stresses and heat treating stresses. Industry is realizing the added benefits in fatigue life for critical metal parts in aircraft, machine tool and bearing design.

Computer Helps Heat Treat

A new temperature analog simulator solves complex heat transfer problems. A kind of electronic computer, it feeds answers (sorely needed, but seldom available) for forging, heat treating, and rolling operations. It can plot heat

transfer from the surface of a billet to its center, thus insuring uniform heating. Or it can predict time and heat input needed to achieve complete temperature uniformity in a steel part prior to quenching.

Production Planning Boost

A computer system, due for installation in the next few months, will turn out complete production plans for varying output rates. Computer speed will get around time difficulties that limit conventional planning. Information will include work rates for feeder lines and manpower needs for all stations.

Develop Plastic Auto Parts

Experimental plastic wheel for cars and trucks has been developed by the Army. It's said to have exceeded steel in strength in some cases. Army is also developing a plastic jeep. Its body has thin walls of fiber glass and polyester spaced 2 in. apart and filled with rigid polyurethane foam. Bumpers, fuel and oil lines will also be plastic. Designed for both fresh or salt water use, the vehicle makes maximum use of non-critical materials.

Pressure For More Spending

Spenders in Congress are chafing at limits on cash outgo set by Ike's Budget Bureau. They threaten to force White House financial planners to conform to spending orders set by Congress. Some money for defense orders has been held up by the Budget Bureau because it was voted for weapons that subsequently became obsolete.

Overdrive Aids Generator

Even at curb idle with all accessories operating, a newly developed auto generator overdrive system insures constant battery charge. The unit works by boosting generator rotation when the engine is running at low speed. It's especially useful for industrial users who demand maximum current at any engine speed to operate such accessories as radiotelephones and fork-lift units.

Lower Cost . . . Cut Maintenance . . . Lengthen Die Life

Lamina

BRONZE-PLATED GUIDE PIN BUSHINGS

Wring-Fit Bushings assure distortion-free assembly in die shoe.

Bushing Bore is straight and concentric. Factory finished to Class 1, 2 or 3 fit to meet your requirements.

Bronze-Plate on hardened steel for strong, free-running, non-galling bushings.

Positive clamping provides holding strength of 2 to 5 times that of press fit.

Ground shoulder of bushing seats on finished surface of die shoe for positive alignment.

90° Bushing I.D. is square to finished surface of die shoe.



LAMINA bronze-plated, wring-fit guide pin bushings are honed on the I.D. for accurate geometry, precise dimensions and to provide the best surface finish for lubrication. Bushings are wring-fit in die shoe to assure distortion-free, full-bearing surface that results in better die alignment, less maintenance and longer die life. In addition the Lamina method of clamping bushings to die shoes provides holding strength of two

to five times that of press-fit bushings. For more accurate press operation, higher production and lower maintenance costs—standardize on Lamina, the originators of Bronze-Plated Guide Pin Bushings.

Lamina also manufactures: Steel Bushings and Guide Pins, Bronze-Plated Wear Plates, and Bronze-plated Parts. Complete facilities for the manufacture of steel or carbide precision dies (lamination, progressive, transfer, etc.).



Lamina Bushings and Guide Pins are made in types and sizes to meet every requirement. More than 800 items are described and illustrated in our catalog—write for your free copy.

Lamina

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LETTERS FROM READERS

Indirect Labor

Sir—I've just read your excellent article "Costs Drop When Indirect Labor Is Brought Under Control" by Harold B. Maynard (Dec. 18 issue).

I would appreciate receiving five copies for use in our company. I find your magazine highly enlightening and thoroughly enjoy reading it. —R. J. Brouce, Jr., Asst. Supt.-Plating, Cadillac Motor Car Co., Detroit.

Sir—We would appreciate three reprints of this article.—A. J. McMurtrie, Milton Steel and Supply Co., Milton, Pa.

Sir—Please send me a reprint of "Costs Drop When Indirect Labor Is Brought Under Control" from the December 18 issue.—A. B. Flanery, Norge Div., Borg-Warner Corp., Muskegon Heights, Mich.

Sir—Please send me a copy of this Special Report to Management.—F. B. Stockton, Chief Ind. Engr., Great Lakes Steel Corp., Ecorse, Detroit.

Sir—Please send two reprints of the article "Costs Drop When Indirect Labor Is Brought Under Control."—R. Ostheimer, Asst. Plant Ind. Engr., Youngstown District Works, United States Steel Corp., Youngstown.

Sir—It would be appreciated if you would forward eight reprints of this article.—R. L. Brammer, Pres., Ackermann Mfg. Co., Wheeling, W. Va.

Automaker Goof?

Sir—Your article "Are Automakers Running Scared," (Nov. 27, p. 31), recalls my experience at a recent auto show here.

I sat in almost all makes trying to find one where the seat was more

than six inches off the floor. I'm not tall but my knees get mixed up with my ears when I sit in one of these super-duper colossal jobs.

Also, most of the new trunks are built so that material has to be lifted about 12 inches to get it in or out. Again, no utility, but possibly "class."

I found a number of auto salesmen apologizing rather than bragging about the "on the floor" seating, the large hump in the floor center, and the fact that six passenger cars are really four passenger because no one can sit in the center, at least for a long ride.

Tell your friends in the auto industry to be scared because we the buying public think they have "goofed" and badly.—G. H. Ackerman, Exec. Vice Pres.-Sales, Missouri Rolling Mill Corp., St. Louis.

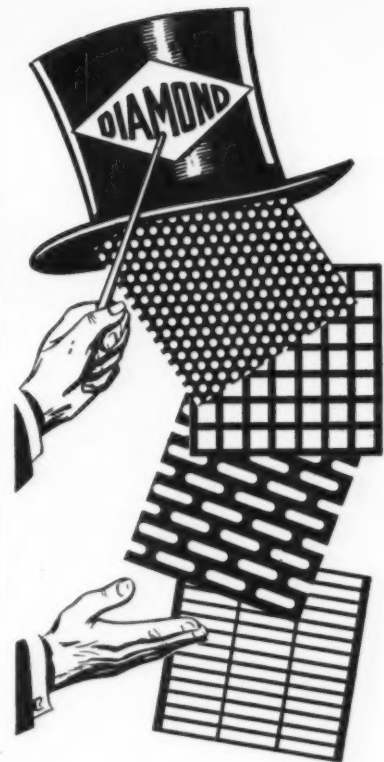


"Our first punched card."

Spending Survey

Sir—I would like to receive a copy of your new quarterly survey of metalworking capital appropriations.

It seems to me a survey of this sort is a worthwhile endeavor and should be of great assistance.—E. R. Smith, Pres., Seneca Falls Machine Co., Seneca Falls, N. Y.



Top-Hat Quality IN Perforated Metal

The popular Diamond Perforated-metal patterns shown above are only a few of the many illustrated and described in our 32-page Catalog No. 39. All of these standard patterns are available in a wide range of unit-opening sizes and we are always equally pleased to quote on original designs of any type or size.

Catalog 39 also illustrates and describes our high-quality lines of Ornamental Cane, Perforated-Metal Sheets for Acoustical installations and Heavy-Duty Architectural Grilles. Write, today, for a free copy.

Correspondence is especially invited regarding ANY requirement for perforated-metal panels or parts. We are equipped to fabricate special sections to any desired extent and welcome opportunities to make money-saving suggestions.

DIAMOND MFG. CO.
WYOMING WILKES-BARRE PA.

Manufacturers of DIAMONTEX, the Perforated Metal Lay-In Panel for better Acoustical Ceilings. New Bulletin No. 47 gives complete illustrated information. Write for free copy.



**Don't buy a "bearing in a poke"
... buy from your authorized
source, **Bearings, Inc.!****

Know what you're buying — *Know* that the manufacturer and Bearings, Inc., as an authorized distributor, stand back of every bearing we sell you! *Know* you're getting the latest most improved design with a maximum, useable life.

Know the bearings you buy are in the manufacturers' original boxes, carefully protected from dirt and

corrosion. *Know* that your bearings are as specified for precision and fit.

Don't buy a "bearing in a poke" from unauthorized sources — Contact your nearest Bearings, Inc. branch and get the best bearings for your needs. You will save time, trouble and money in the long run!

*Providing bearing service
in the North>*

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in the South>

BEARINGS, INC.

OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Lockland • Mansfield • Toledo • Youngstown • Zanesville
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WEST VIRGINIA: Charleston • Huntington • Parkersburg • Wheeling • **NEW JERSEY:** Camden
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FATIGUE CRACKS

Mark Your Calendars

While the year is still fresh and shiny we'd like to call your attention to what's ahead. During the months to come there will be many special weeks and holidays. So that none slip by unsung we suggest you make note of these:

March 1-7 Return The Borrowed Books Week.

Purpose: "To remind the guy down the street to bring back Vol. III of our encyclopedia and to remind us to return his copy of Joe Miller's Joke Book (if we can find it)."

Sponsor: Inter-Global Society for the Prevention of Cruelty to Cartoonists, Al Kaelin, Secy., 3140 Chadwick Drive, Los Angeles 32, Calif.

May 9-15 Let's Go Fishing Week.

Purpose: "To stimulate greater interest and participation in fishing." Sponsor: The Sporting Goods Dealer, Roland D. Burke, Associate Editor, 2018 Washington Avenue, St. Louis 3, Missouri.

May 11 National Tax Freedom Holiday.

Purpose: "To dramatize the total local, state, and federal tax load being carried by the average American. May 11th is first day in 1959 he works for himself."

Sponsor: Florida State Retailers Association, Dallas L. Hostetler, Executive Director, Box 735, Winter Park, Florida.

Oct. 1-31 Let's Go Hunting Month.

Purpose: "To stimulate greater interest and participation in hunting and shooting sports." Sponsor: The Sporting Goods Dealer.

Job Well Done

Understanding other nations is important. Any written material adding to that understanding is worthwhile. And if the job is done

with humor and skill it's doubly worthwhile.

That is why we commend the U. S. Chamber of Commerce on a recent booklet about Canada. It was prepared by the United States Section of the Chamber's Canada-United States Committee.

Title is "Are Canadians Really or, For That Matter Is Canada?"

We particularly liked the chapter titles. Some were: What Do Canadians, and Where?, Do Canadians Hibernate?, How Big is Small?, and Just A Pebble.

Aluminum Half-Shell

Next time you go into a restaurant don't be surprised if the menu reads, "deviled crab on the aluminum foil half-shell."

This is metalworking's latest contribution to better living. A rigid

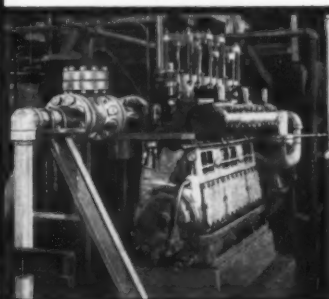


foil simulated shell to pack, bake, and serve deviled crab is now available from Kaiser Aluminum & Chemical Sales, Inc. (See photo.)

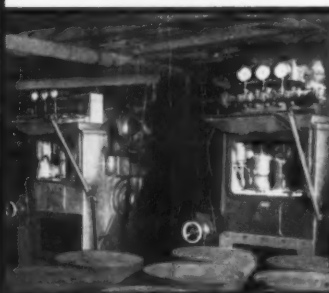
Gold colored foil shells are now being used abroad by one of the major airlines.

Formerly the deviled crab was packed in natural shells. But cleaning and sanitizing the shells was troublesome. And during off-seasons the natural shells were unsuited for packing purposes.

COMPLETE CENTRAL HYDRAULIC SYSTEMS FOR



die casting



extruding



plastics molding

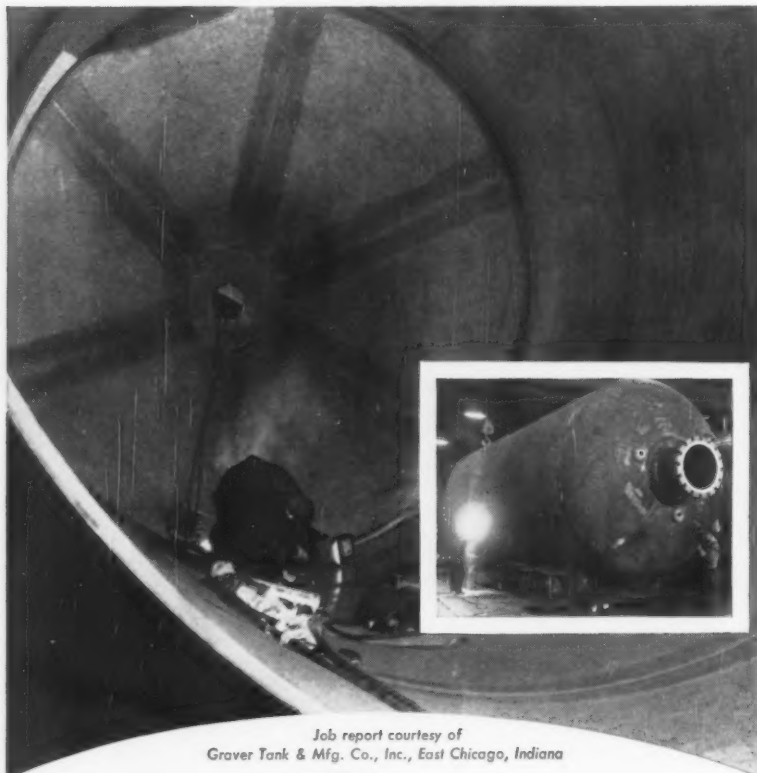
From Aldrich you get all the benefits of unified engineering plus the newest in pumping equipment. Aldrich Direct Flow Pumps to 2500 hp. Aldrich-Groff Controllable Capacity pumps to 125 hp. Pressures to meet your requirements. Write for data.

LOWER PUMPING COSTS WITH



Aldrich Pump Company
3 Gordon Street, Allentown, Penna.

When stainless welds must be free of microcracks



Job report courtesy of
Graver Tank & Mfg. Co., Inc., East Chicago, Indiana

WELD WITH

ARCOS 

STAINLESS ELECTRODES

This 93,400-lb. 3500 cu. ft. digester is installed at Finch, Pruyn and Company, Inc., manufacturers of printing and converting papers. It converts hardwood into paper pulp using highly corrosive acids at high temperatures, and pressures of 200 psig. The digester is made of Type 316 ELC 20% stainless clad on ASTM A-212 Grade B firebox steel. To assure sound, long-life corrosion-resistant welds, three grades of Arcos CHROMEND Electrodes were used. All welding was manual. The resultant welds were completely free of micro fissures or cracks—more proof why Arcos weld metal is used so widely to combat destructive and costly corrosion. Write for an Arcos Stainless Application Chart. ARCOS CORPORATION, 1500 South 50th Street, Phila. 43, Pa.



COMING EXHIBITS

Plant Maintenance and Engineering Show—Jan. 26-29, Public Auditorium, Cleveland. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

International Heating and Air Conditioning Show—Jan. 26-29, Convention Hall, Philadelphia. (International Exposition Co., 480 Lexington Ave., New York 17.)

Western Metal Show—March 16-20, Pan-Pacific Auditorium and Ambassador Hotel, Los Angeles. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Corrosion Show—March 16-20, Chicago. (National Assn. of Corrosion Engineers, 1061 M & M Bldg., Houston 2, Texas.)

1959 Nuclear Congress—Apr. 5-9, Cleveland Auditorium, Cleveland. (Engineers Joint Council, 29 W. 39th St., New York 18.)

Engineered Castings Show—Apr. 13-17, Sherman and Morrison Hotels, Chicago. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

Packaging Exposition—Apr. 13-17, International Amphitheatre, Chicago. (American Management Assn., 1515 Broadway, New York 36.)

Powder Metallurgy Show—Apr. 20-22, Sheraton - Cadillac Hotel, Detroit. (Metal Powder Industries Federation, 130 W. 42nd St., New York 36.)

Industrial Finishing Show—June 15-19, Detroit Artillery Armory, Detroit. (Information: H. J. McAleer, 3171 Bellevue, Detroit 7, Mich.)

MEETINGS

JANUARY

Hoist Manufacturers Assn.—Annual meeting, Jan. 22, Palm Beach Biltmore, Palm Beach, Fla. Asso-

(Continued on P. 15)

EXHIBITS, MEETINGS

(Continued from P. 14)

ciation headquarters, One Thomas Circle, Washington 5, D. C.

Institute of Surplus Dealers — 9th annual trade show, Jan. 25-28, New York Trade Show Bldg., New York. Institute headquarters, 700 Eighth Ave., New York.

Truck Trailer Manufacturers Assn. — Annual convention, Jan. 26-28, Hollywood Beach Hotel, Hollywood, Fla. Association headquarters, 710 Albee Bldg., Washington 5, D. C.

Society of Plastic Engineers, Inc. — Annual technical conference, Jan. 27-30, Hotel Commodore, New York. Society headquarters, 65 Prospect St., Stamford, Conn.

Association of Roller & Silent Chain Manufacturers — Annual meeting, Jan. 28-29, Drake Hotel, Chicago. Association headquarters, 3343 Central Ave., Indianapolis.

Steel Plate Fabricators Assn. — Annual meeting, Jan. 28-30, Roosevelt Hotel, New Orleans. Association headquarters, 105 W. Madison St., Chicago.

FEBRUARY

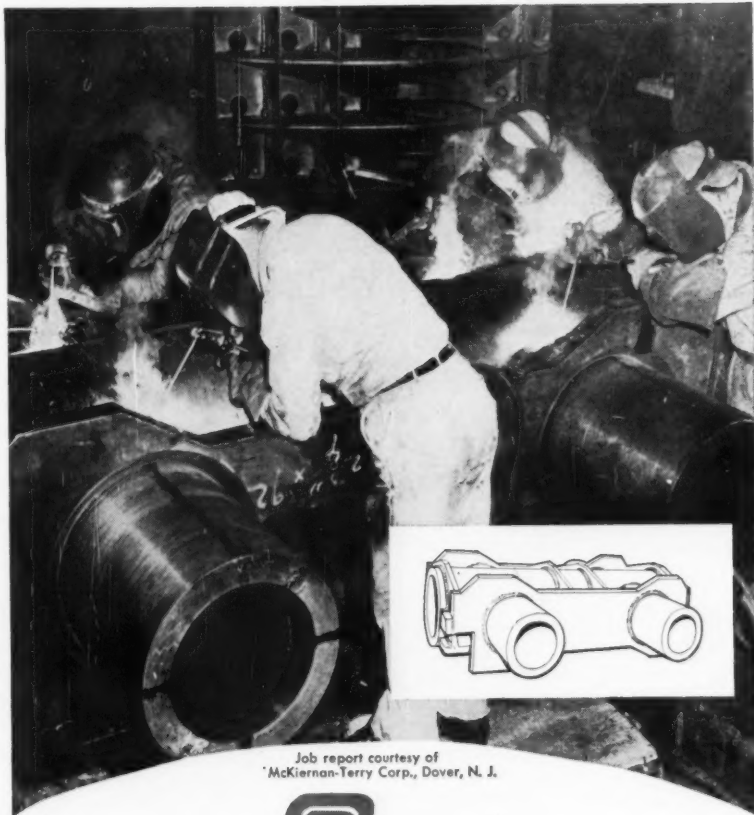
American Society for Testing Materials — Committee Week meeting, Feb. 2-6, Penn Sheraton Hotel, Pittsburgh. Society headquarters, 1916 Race St., Philadelphia.

American Coke and Coal Chemicals Institute — Western regional meeting, Feb. 5, Drake Hotel, Chicago. Institute headquarters, 711 14th St., N.W., Washington, D. C.

The Metallurgical Society of AIME — Annual meeting, Feb. 15-19, St. Francis, Sheraton-Palace, and Sir Francis Drake Hotels, San Francisco. Society headquarters, 29 W. 39th St., New York.

Association of Steel Distributors, Inc. — Annual convention, Feb. 15-21, The British Colonial Hotel, Nassau, Bahama Islands. Association headquarters, 29 Broadway, New York 6, N. Y.

When low alloy weld requirements are as critical as these

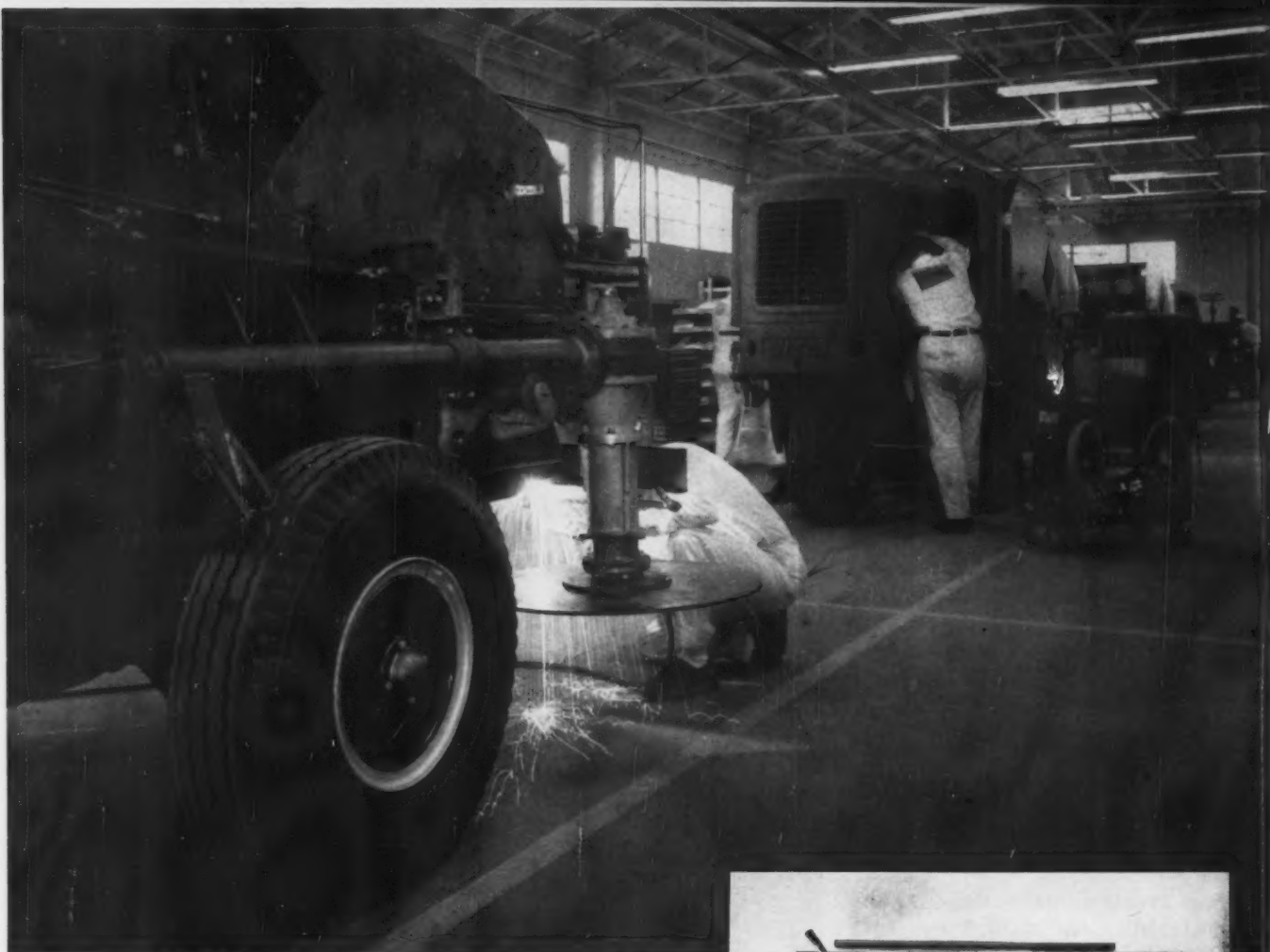


WELD WITH **ARCOS**

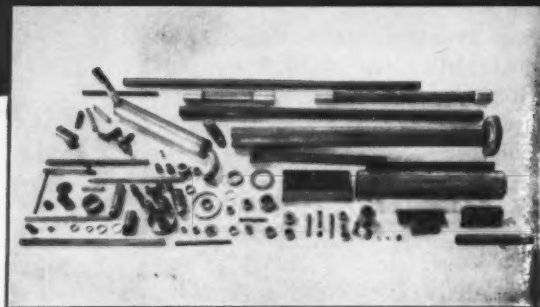
LOW HYDROGEN ELECTRODES

This crosshead weldment—part of a Navy steam catapult for launching jet fighters—must withstand the repeated powerful surges of steam under high pressure. Arcos Tensilend 80 electrodes were used to weld the SAE 4130 low alloy steel. After progressive magnaflux checking, and proper stress relieving, all welds were found to meet the high strength and toughness required for this kind of service. For the right weld metal—for the right welding techniques—for your tough welding problems—call on Arcos. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.





Seven-million miles of street and industrial sweeping in 700 cities have proved rugged dependability of Wayne Manufacturing Company's equipment. Here is the final assembly line in its plant. Large horizontal tube on sweeper is jack shaft housing for gutter broom drive. Wayne makes 300 parts from Pittsburgh Steel's Seamless cold-drawn tubing (see inset at right). That's how ...



Pittsburgh Steel Seamless Tubes Help Wayne Make Clean Sweep

Nobody knows how many brooms it would take to keep the world clean. But out in Pomona, California, Wayne Manufacturing Company is ready to tackle the job with a complete line of power sweepers.

Founded only ten years ago, the Wayne Company has grown rapidly until today it produces more street and industrial power sweepers than all others in the field combined. Wayne is the only power sweeper produced by assembly-line operation.

Largest Wayne sweepers handle up to four cubic yards of debris at a time. Their assembly requires more than 1,000 complicated and accurately manufactured steel parts.

• **300 Key Parts**—Of these, more than 300 key items are fabricated from Pittsburgh Steel Company's Seamless Tubing in both carbon and alloy grades in sizes ranging from one-quarter inch to six inches in diameter. It is furnished cut to length and ready for fabrication by Baker Steel & Tube

Company of Los Angeles, a Pittsburgh Steel distributor.

This service helps speed Wayne production, keeps inventories down and is typical of service rendered by all Pittsburgh distributors.

"Requirements for the parts produced from Pittsburgh tubing are exacting," says Wayne production vice-president, Roy E. Nelson. "Our sweepers are doing big jobs, many of them operating on a 24-hour schedule, and we

must have a tough, dependable product in the critical spots to take this constant heavy beating."

That is why Wayne uses Pittsburgh Seamless Tubing in critical components such as rugged axle assemblies, torque housings, drive shafts, hydraulic actuating cylinders—even small fittings.

Over the years, Wayne production men have found Pittsburgh tubing has the surface finish, close size tolerance and concentricity which minimize the amount of machining that must be done. Its uniformly high physical properties and internal soundness provide the stamina necessary for long, trouble-free service.

• **Ease of Fabrication**—The machinability and weldability of Pittsburgh tubing make for ease of fabrication, keep scrap losses down, and assure uniform parts—all important factors in keeping production lines moving smoothly.

As an aid to industrial good house-keeping, Wayne produces smaller power sweepers for use inside and outside plants. Its newest line is the Autoette series which includes the glamorous "Golfmobile" and the family "Cruise About." Three industrial models provide efficient transport of personnel and materials in sprawling plants.

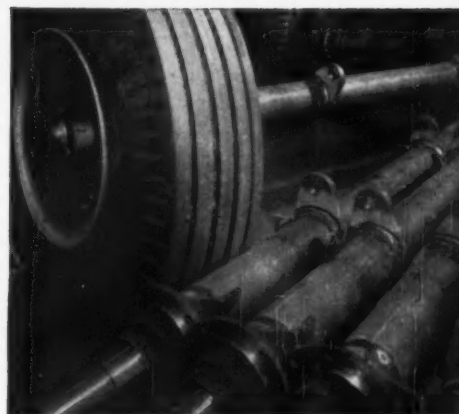
These industrial sweepers and Autoettes also depend upon Pittsburgh Steel tubing for parts in key assemblies.

Manufacturers find the uniformly high quality of Pittsburgh cold-drawn steel seamless tubing and excellent service from Pittsburgh distributors are big assets in improving products and operating efficiency. To enjoy these benefits get in touch with the representative nearest you.

Pittsburgh tubes withstand torque and fatigue in main and auxiliary drives on Wayne sweepers.



Machinability and weldability of Pittsburgh tubes are vital in making this shaft which goes into differential assembly. Short tube is welded over longer, smaller diameter tube, then machined to tolerance of .001 inch to assure perfect fit in housing.



Rugged front axle assembly of Wayne sweeper made from Pittsburgh tubes carries most of weight of machine and up to four cubic yards of debris. It must withstand road shocks and constant heavy-duty operation.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California
Chicago Tube & Iron Company
Chicago, Illinois
Cleveland Tool & Supply Co.
Cleveland, Ohio
Drummond McCall & Co., Ltd.
Montreal, Quebec, Canada
Edgcomb Steel Company
Philadelphia, Pennsylvania
Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.
Perry Kilsby, Inc.
Los Angeles, California
Mapes & Sprowl Steel Co.
Union, New Jersey
Metal Goods Corporation
St. Louis, Missouri
Miller Steel Company, Inc.
Hillside, New Jersey
A. B. Murray Co., Inc.
Elizabeth, New Jersey

C. A. Russell, Inc.
Houston, Texas
Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois
Solar Steel Corporation
Cleveland, Ohio
Steel Sales Corporation
Chicago, Illinois
Tubular Sales
Detroit, Michigan
Ward Steel Service Company
Dayton, Ohio

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.



DISTRICT SALES OFFICES

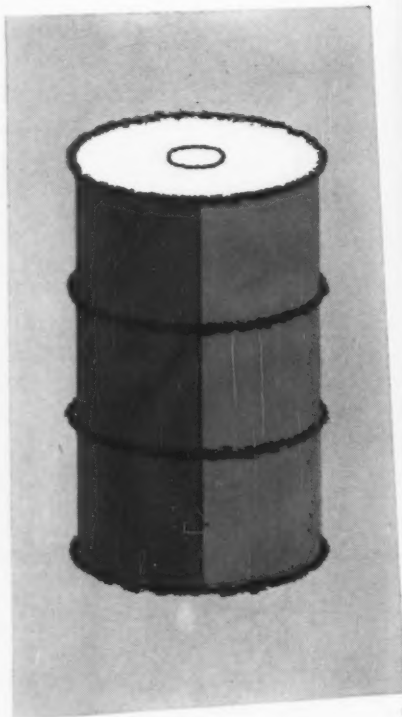
Atlanta Cleveland Detroit
Chicago Dayton Houston

Los Angeles Pittsburgh
New York Tulsa
Philadelphia Warren, Ohio

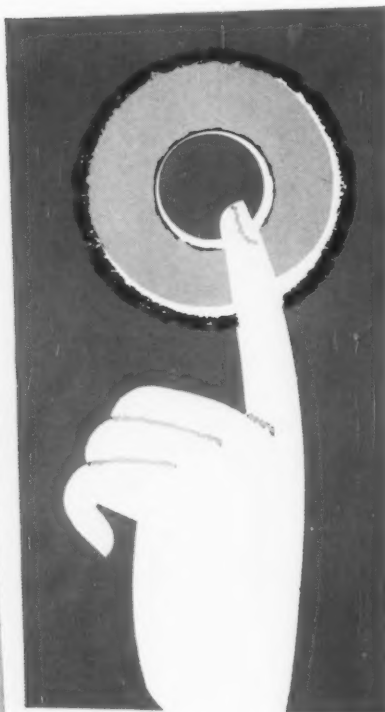
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for best finishes at lower cost ... use Pennsalt's complete metal preparation service

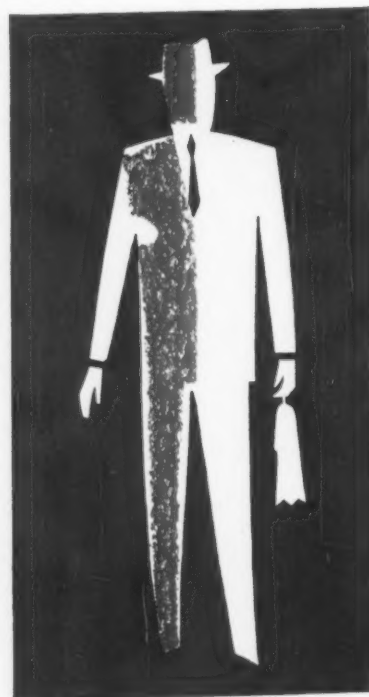
Let Pennsalt's "system approach" to metal preparation pay off for you. Pennsalt supplies the chemicals, the machinery and the engineering help to bring you best possible finishing results at considerable savings.



Materials: Pennsalt offers a complete line of metal processing chemicals—metal cleaners, etchants, brighteners, descaling and pickling compounds, phosphating agents, drawing lubricants, paint strippers, strippable vinyl coatings.



Machines: Pennsalt supplies automatic spray coaters, power spray washers, automatic pickling machines, phosphatizing machines, and complete finishing systems, built to your specifications.



Men: Pennsalt field men are specialists in metal preparation. They're well qualified to analyze your present or planned process, give you detailed recommendations, and set up a finishing line for you. They make regular service calls to keep your line running smoothly and profitably...and show you how to save chemical costs.

... a better start for your finish



Call or write Pennsalt today for a consultation and quotation on your requirements.

Metal Processing Department 689
PENNSALT CHEMICALS CORPORATION
Three Penn Center, Philadelphia 2, Pa.

AUTO PARTS MAKERS are facing stiffer competition from their own customers. Ford is making transmissions of its own design, and Chrysler is getting into electrical parts making. It's all part of an old trend. But the auto companies will always need outside parts suppliers, say Detroit sources.

COMBINING AIR FREIGHT WITH LOCAL PARCEL POST puts 100 lb shipments from Boston into Los Angeles overnight. At L. A. bulk shipment is broken down for local delivery at added cost of 13c a lb. A Boston printer who has been doing this for years now suggests Post Office make it a regular service for small packages.

MARKETING RESEARCH IS GOING FULL-TIME with more companies. Full-time market research has risen more than 500 pct since World War II among companies surveyed by American Management Assn. More than three-fifths of 195 companies surveyed have at least one full-time marketing research employee.

ALUMINUM USE IN AUTOS is growing. Aluminum Co. of America reports the average new car now contains 51.58 lb of aluminum. This compares, says Alcoa, with 35.2 lb in 1956 and 47.3 lb in 1958.

STAINLESS STEEL IS A STRONGER COMPETITOR in the architectural field from a price standpoint. W. B. Pierce of Allegheny Ludlum says "recent stainless steel window quotes have dropped from over \$300 per unit to \$160."

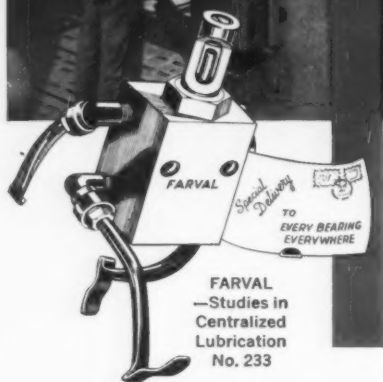
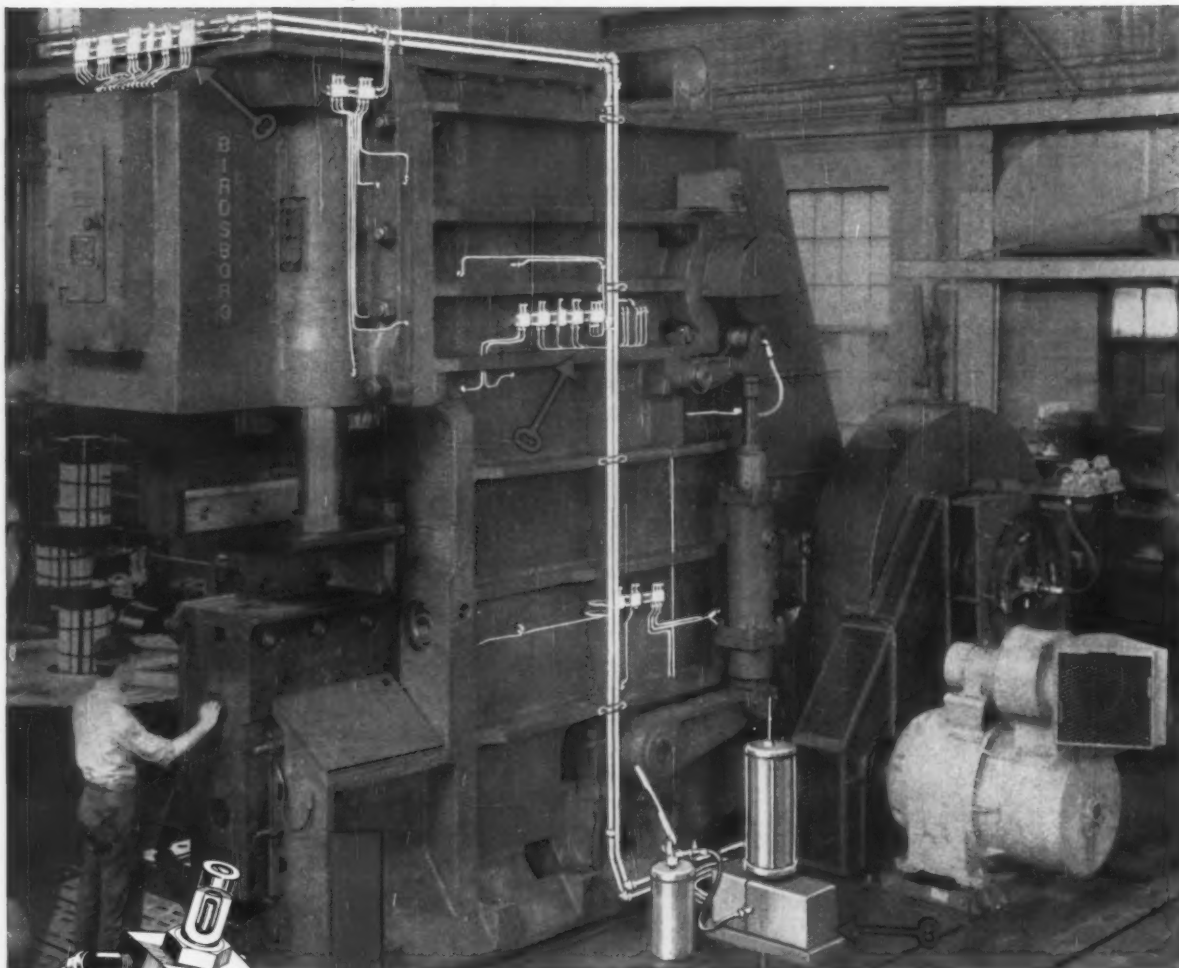
LOOK FOR APPLIANCE PRODUCTION to continue climbing upward. Buying schedules of one major refrigerator maker have been stepped up to match heavier March output plans. The industry is moving cautiously but can't keep pipelines filled at present rates of output.

ELECTRONIC EQUIPMENT for missiles and aircraft head for a \$3 billion sales year. Stephen F. Keating, vice president of Minneapolis-Honeywell Regulator Co., predicts a gain in dollar sales of 30 pct over 1958's \$2.3 billion. He says demand for more engineering content and greater reliability "will more than offset the decline in production-line output."

MATERIAL HANDLING EQUIPMENT SLUMP may be over. Material Handling Institute reports that November sales held about the same as October's. Normally, November is a poor month for the industry. MHI predicts sales will pick up during first half '59.

MALLEABLE FOUNDERS LOOK FOR conversion of additional auto and other parts to malleable castings. Door hinges were a recent conversion and now use 1500 tons of malleable per month. Connecting rods might also be converted, founders believe.

INDUSTRIAL PRODUCTION ROSE AGAIN in December. The Government reports the December industrial output index was 142 pct of the 1947-49 average, up one point over November.



Farval automatically lubricates 61 bearings on this Birdsboro Shear at Sharon Steel Corporation

This giant 1000-ton Birdsboro hot bloom and slab shear—largest of its type—completes a cut in only $4\frac{1}{2}$ seconds. Actual cutting is done by the rising action of the up-and-down cut shear's bottom knife—gives square-cut ends free from hook.

Keeping this heavy-duty cycle machine in production around-the-clock requires continuous, positive lubrication. So a modern motor-driven Farval system was installed. It's time clock controlled to eliminate the human element—makes sure the shear's 61 bearings are never without proper lubrication.

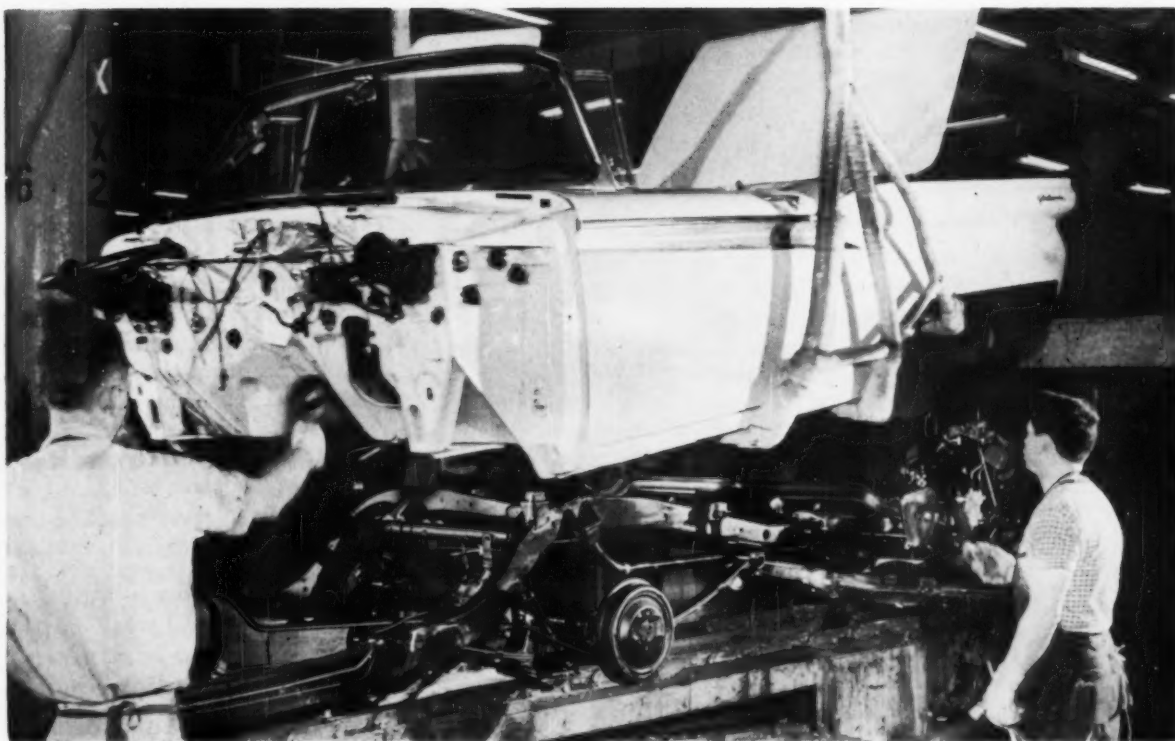
Remember, for the ultimate in bearing protection on any of your production machines—it's Farval. For the latest information on what Farval can do in your plant, write for free Bulletin 26-S. The Farval Corporation, 3282 East 80th Street, Cleveland 4, Ohio.

*Affiliate of The Cleveland Worm & Gear Company,
Industrial Worm Gearing. In Canada: Peacock Brothers Limited.*

KEYS TO ADEQUATE LUBRICATION

Wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.





SIGN OF TIMES: These Ford bodies are made by Ford. At one time, company bought from outside supplier.

Why Auto Suppliers Face Stiffer Competition

Big Three carmakers do more of their own work, buy less of total needs from outside.

Decline of independent auto companies has added to suppliers' woes.—By H. R. Neal.

■ Early this month a plant in Indianapolis began to turn out distributors for one of the Big Three automobile manufacturers.

Last summer a new plant in Sharonville, O., began to produce automatic transmissions for another member of the Big Three.

A large auto plant on Detroit's East side is crumbling under the

impact of a swinging steel ball.

Six months ago, a quarter-century-old trade association quietly wilted on the vine and slipped into a state of dormancy.

These seemingly unrelated events are actually tied together. They are some of the more recent developments which, when combined, spell a declining market and stiffer competition for automotive parts suppliers.

The new distributor is the first product of Chrysler Corp.'s new electrical equipment division. In the next 18 months Chrysler will start production of starter motors, generators, voltage regulators, and

other electrical equipment.

Ford Goes It Alone—Until the present model year began, most of Ford Motor Co.'s automatic transmissions were based on one designed by Borg-Warner Corp. The two companies shared production on a 50-50 basis. Now Ford's new Sharonville plant is turning out a Ford-designed automatic transmission.

Last summer the Automotive Parts Manufacturers Assn. was quietly "mothballed" by its members after 25 years. Its Detroit and Washington, D. C., offices were closed, staff discharged, dues col-

lecting discontinued, and it ceased to function.

Hudson Plant Crumbles—The former Hudson Motor Car Co.'s old factory is being razed. The Hudson is no longer being built. And the land is more valuable today than the six-story high buildings.

Revival of the partsmakers association is unlikely. Increasing numbers of supplier firms are no longer primarily "auto oriented." When formed, 80 pct of AMPA's members did almost all of their business with the automakers. Now, few of them rely entirely on the auto industry for their business. Diversification has changed many former "100 percenters" into only 30 pct to 60 pct automotive.

Study Shows Trend—Determining just how much business the automakers have pulled in to their own plants and how much supplier firms have lost is next to impossible.

However, the Bureau of Labor Statistics made wage analysis studies of the two groups in both 1950 and 1957. In the first study, motor vehicle companies employed 447,383 workers and manufacturers of motor vehicle parts had 317,670 employees.

In a similar study for 1957 employment by the vehicle makers had increased to 490,674 while partsmakers had dropped to 226,145 employees. Passenger car and truck production in 1950 was 7.8 million units. In 1957 it was 7.2 million units. Any comparisons, however, should be considered general

rather than specific as the BLS studies were made for wage analysis purposes and not as a census.

Supplier's Share Drops—Regardless, without an appreciable reduction in numbers, parts suppliers are getting a smaller share of the automobile business than they did 10 years ago. But there is no single reason for this.

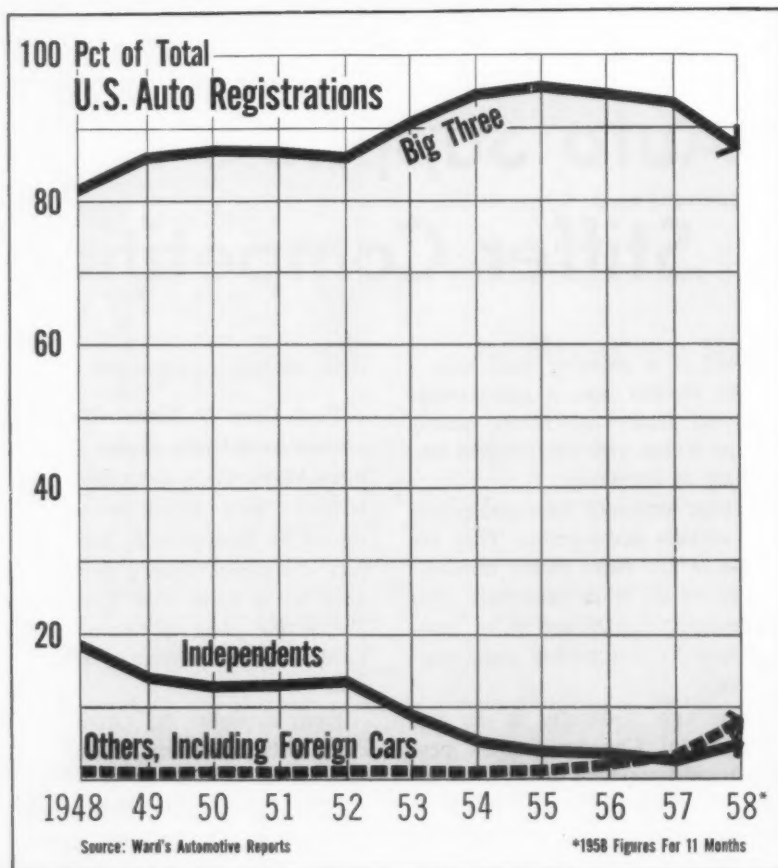
Integration of operations by leading auto companies, certainly, is one reason. At one time or another, Murray Corp. of America had been a supplier to just about all of the automakers. At its peak, around 1951, the firm employed 10,000, making auto bodies for several cars. Its sales that year were \$140 million while profits were \$7.6 million.

Ford Lowers Boom—At the end of the 1951 model year Ford withdrew its contract as it moved to integrate its body operations. The next year Murray's sales and profits dropped—despite the fact it still made bodies for other cars. But Ford's move wasn't unexpected. A diversification program, already underway, was stepped up. Three years later, Murray was out of the auto body business. Chrysler meanwhile had taken over the Briggs body-making units.

Where 10 years ago Borg-Warner sales were concentrated 60 to 65 pct in the automotive field, it was only 35 to 38 pct in 1958. Similar shifts of emphasis have been made by others. Thompson Ramo-Woolridge, Inc., is down from 100 pct automotive to about 40 pct; Bohn Aluminum & Brass Corp. from 90 pct to 30 pct; Eaton Manufacturing to about 40 pct from 90 pct.

Decline of Independents—The decline of the independents has also had a significant effect on the changing volume for the automotive parts suppliers. Little change has been made by GM for years in the pct of its parts needs purchased outside. It was fairly well integrated prior to WW II. Since then it has consistently bought about 50 pct

Decline of Independents Has Hurt Auto Parts Makers



outside and manufactured the remainder itself.

This hasn't been true of the other companies. Best guesses are that about 60 pct of Ford Motor Co.'s products are still made outside the company.

Chrysler Makes More—Chrysler Corp. currently has some 8000 suppliers of automotive parts and components compared with about 6000 back in 1948. These are suppliers of production parts for automobiles and trucks only, and don't include suppliers of non-production goods and services or any of its defense suppliers.

Although Chrysler has more suppliers today, it is also manufacturing a larger number of its own components than it did 10 years ago. This change was primarily brought about by purchasing several large supplier firms, such as the body division of Briggs and Universal Products Corp., which supplied universal joints. The company now has 43 active manufacturing plants in the U. S.—21 of which were constructed or acquired since the end of WW II.

And It Will Make Still More—But seldom do these companies manufacture all of their requirements for any component—with the possible exception of bodies. For example, Chrysler makes about 50 pct of its pistons, but could make 75 pct.

But now Chrysler has formed its own electrical equipment division and has begun production of some of its electrical parts—the distributor produced at Indianapolis is the first. In the next 18 months the automaker will start production on starter motors, generators, voltage regulators and other electrical equipment.

Behind the Move—Electric Auto-Lite Co., has been Chrysler's primary supplier of electrical components for a number of years. And an Auto-Lite strike came close to closing down Chrysler due to a shortage of parts. In the future the



STAINLESS: Trend to stainless steel applications such as these in auto-making has hit platers and zinc diecasters. Aluminum also has hurt.

company will have two sources of supply, plus the advantage of competitive bidding between its own division and Auto-Lite for the electrical business.

Despite the trend toward integration, Chrysler still buys about 65 pct of the parts going into its cars. Ten years ago it probably bought 70 to 75 pct of its parts from outside vendors.

Labor Factor—Labor is another factor contributing to a smaller share of the business for supplier firms. Wage rates for production workers generally, followed closely those paid by automobile manufacturers. However, indirect labor costs have sometimes added to the burden.

Product and technological changes have brought changes in the supplier picture. In recent years the trend toward increased use of stainless steel and aluminum in trim applications has sharply reduced the available business for platers and zinc die-casters. Compared with 10 years ago, very little chrome plating is used except for bumpers or

name plates. Before, only a relatively few high-priced cars used either of the corrosion-resistant materials.

Reason for Hope—The squeeze on parts suppliers is bound to continue, but it's unlikely the automobile companies will want to make much more than 50 pct of their own parts. For one thing, they want several sources of supply. For another, many supplier firms have developed specialized skills and engineering knowledge that automakers can draw on to supplement their own research and development staffs.

American Motors' suppliers were recently told that company doesn't intend to expand its manufacturing outside areas it is already in.

Market Still Big—While the original equipment market is not as big as it once was, it is still big. One supplier, C. M. Hall Lamp Co., has estimated auto parts sales will reach a \$3.3 billion volume this year. This compares, the firm says, with \$2.2 billion in 1958 and \$2.7 billion in 1957.

Hollow Moly Cylinder Is Cast

Bureau of Mines Scientists Rack up a "First"

Bureau's Albany, Ore., laboratory produces a centrifugal casting.

It's considered a big step toward better missiles for exploration of outer space.

■ U. S. Bureau of Mines scientists have hurdled an oxidation problem and harnessed a high melting point to produce what they say is the first hollow cylindrical molybdenum casting.

It is considered a forward step in the U. S.'s drive on space exploration. And it offers promise to any industry that must develop parts that work well at high temperatures.

Fabricating Molybdenum—Extensive work with molybdenum is

also being done by Universal-Cyclops Steel Corp. at a unique laboratory at Bridgeville, Pa. U-C has cast molybdenum, but in ingot form for rolling or further fabrication.

Molybdenum melts at 4748°F. And it maintains high strength at high temperatures; ideal for rockets, missiles, jet engines, and re-entry vehicles. But this high melting point was a stumbling block to casting because molten molybdenum would melt ordinary crucibles and coring agents. Also, molybdenum oxidizes readily at about 2400°F with heavy smoke.

Scientists at the Bureau of Mines labs at Albany, Ore., used the same technique as U-C to overcome oxidation—inert atmosphere.

How it Was Done—The molyb-

denum charge was melted in a water-cooled, copper-lined crucible with a high-density electric arc. The molten material was poured through a series of troughs to a rotating graphite cylinder. The spinning forced the molten moly to the walls where it froze. After the first critical layer, molybdenum-deposited-on-cooling molybdenum eliminated the mold melting problem. The first casting was 4½ in. wide, 8 in. long, and weighed 30 lb.

About 90 pct of the known world reserves of molybdenum are in continental U. S., about three billion lb. Few other metals have a melting point higher than molybdenum. Tungsten is the main one. But there is little in the U. S.

Money Saver—The Bureau of Mines molybdenum "strike" also opens up other possibilities. In the afterburner or exhaust of some jet aircraft, for instance, molybdenum is desirable because of its strength at high temperatures.

The part is basically a hollow cylinder. Molybdenum sheet is available. But to bend these into cylinders is difficult and costly. Welding techniques with molybdenum still have a long way to go. The process is slow, and the reject rate is high.

Others Are Costly—Other fabrication techniques now used include several costly and time-consuming steps—pressing a shape from powder, forging, then machining; or extruding, forging, and machining.

To hog out a tube from a solid piece is almost out of the question. Scrap rate is very high, and molybdenum costs about \$10 per lb. Also, very small cuts must be made. This is too time consuming.

With the new technique, the part may be cast very close to finished size.



FIRST: Bureau of Mines metallurgist S. L. Ausmus (l.), and chemist E. D. Calvert display the first hollow molybdenum casting ever made.

Ike Wants All-Out Attack on Inflation

Major Problem Status—Ike's economic advisers now rate inflation as the nation's gravest fiscal problem. To combat it, they want the Congress to declare "price stability" a permanent Federal economic goal.

Since 1946, the only such goals on the law books have been maximum production, maximum employment, and maximum purchasing power. Now, inflation may be added to the list of major economic

problems for which Washington is to seek forceful solution.

Control Opponents—Controlling inflation is going to be as serious a problem as inflation itself. Many businessmen, particularly those who take their profits from investments, do not want it controlled.

Assuming it should be controlled, however, the big question is this: How far should Washington go in exercising anti-inflation powers? Ike

suggests the creation of government committees. They would exercise moral suasion only.

Price Rise Approval?—But there are many in Congress who want to empower the government to pass on all price rises posted by steel, metal-working, and other basic industries. The injustice here is that costs, such as labor, would continue to rise. Only prices would be held down by Washington.

Ike's Budget: The Battle Is On

Spending plans mark shift to traditional GOP conservatism by Administration.

But Democratic majorities are expected to upset Ike's plans.—By N. R. Regeimbal.

■ President Eisenhower's balanced \$77 billion budget for the new fiscal year, squeezed dry of many non-essentials, marks an important shift toward traditional GOP conservatism by his administration.

But is a solid invitation to Democrats in Congress to play the spending game to the hilt. Even conservative Democrats predict that "the spenders will prevail" in the end.

What It Calls For — The new budget (for the 12 months beginning next July 1) calls for outlays of \$77.03 billion, and income of \$77.1 billion. This would put spending almost \$4 billion below the current year. With the help of some higher taxes, such as on gasoline and postal rates, Ike hopes for a \$70 million surplus next year, compared with a \$12.9 billion deficit this year. But these higher rates

will be hard to win.

If his program is balanced, he says, "tax reforms" may be possible in 1960. This might include more realistic plant and equipment depreciation laws—if business starts fighting for them now. But corporate and personal tax cuts are far off.

What Congress Wants—Congressional leaders are making it clear they are accepting the challenge laid down by the President when he warns that he only recommends; it is the lawmakers who are responsible for the final fiscal product. Military spending proposals will be the first to feel the drive. Total defense spending will rise \$145 million to \$40.8 billion.

An \$800 million boost in missile spending is charted by the President—consisting of \$500 million more for missile procurement and the lion's share of some \$3.3 billion planned for research, development and testing. As a partial offset, procurement of so-called support aircraft and ships will be cut.

What Military Will Buy — The

military will buy "considerably" more of its top jets—the B-52 and the new B-58 bombers, and the KC 135 jet tankers. Development of the new high-altitude intercontinental B-70 bomber will continue. But there will be no orders for interceptors and fewer for fighter-bombers, "reflecting the increased reliance on missiles."

The new budget provides for a new conventionally-powered super-sized aircraft carrier; six guided missile ships, three nuclear-powered subs, and advance procurement for three more subs equipped to fire the Polaris missile.

Atomic Energy—In other areas, the President is asking for a \$500 million boost in mutual aid funds (to \$3.9 billion); a cut of \$1.3 billion in funds for commerce and housing aids (to \$2.2 billion), and \$800 billion reduction in farm spending (to \$5.9 billion), and minor cuts in most other programs.

Atomic energy spending will go up by \$100 million to \$2.74 billion, but stockpiling and defense expansion programs will drop by about the same amount, to \$265 million.

Scrap Faces Up to a Tough Job

Industry Hitches Belt to Fight Market Inroads

Scrap Institute president defines biggest task: Improve the product.

Better times lie ahead, but long-term problems must be solved.—By J. B. Delaney.

■ The scrap iron and steel industry took a hard look at itself last week. What it saw was not all bad. It wasn't good, either.

But when the 31st annual convention of the Institute of Scrap Iron & Steel broke up at the Waldorf-Astoria in New York, there was some hope the industry would roll up its sleeves and do something

about its shortcomings.

A Natural Reaction—This was a natural reaction to the industry's worst year since 1946. In 1958, purchased scrap used in the U. S. was about 22 million tons; in 1946 it was 20.8 million. Even the prospect of a better year ahead failed to stir much hope that somehow everything would be all right again and that the "good old days" would return of their own accord.

It was apparent that from the long-term view the industry has a lot of work to do. Either that or run the risk of a gradual decline that would hurt both itself and its biggest customer, the steel industry.

To the Facts of Life—The conventioners heard more words of cheer from Tom Campbell, editor-in-chief, *The IRON AGE*, than they heard from their own president, Myron L. Chase. But neither did Mr. Campbell mince words about what the industry will face in the years ahead.

Mr. Chase, who is assistant to the president of Luria Brothers & Co., Inc., laid it on the line. He said, in effect, that the industry ought to quit tilting at non-essential windmills and concentrate on one basic objective: Delivering a product that the steel mills cannot afford NOT to buy.

Here's what Mr. Chase had to say:

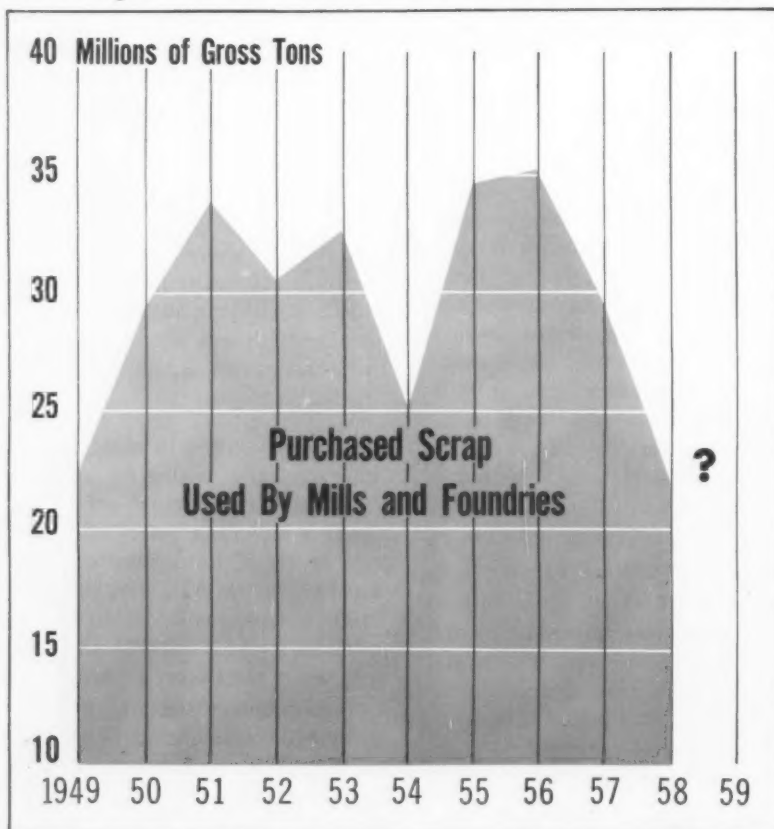
On Quality—"We must realize that there can be only one way to increase scrap consumption. It must become a high quality, competitive material at all levels of demand, and it must withstand ever-increasing competition from alternate sources of metallics."

On Mill Use of Scrap—"There is nothing "personal" about the technological changes in steel that have made the industry less dependent on scrap. "We are not a marginal industry because of any malevolent plan or desire of the steel industry. We are in a marginal position because our product does not compete consistently in quality and price."

On the Future—"Changing steel industry technology has already made serious inroads into our market position. We must strive not only to recapture our markets, but we must also take positive action to insure our share in the future market as the steel industry expands."

What to Do—The industry should hire a director of research, arm him with a good budget and

Scrap: Will 1959 End the Slump?



put him and his staff to work on the problems ahead. The first objective should be quality of product. This, in turn, would lead to stability of demand: "If today our product were of sufficient quality at a fair price . . . our market position would be substantially better."

Whether Mr. Chase's recommendations are carried out is up to the board of directors of the institute, which will act on the report of a special committee.

Better Times Ahead—Mr. Campbell predicted things would be better for scrap people in the months ahead. "Scrap prices and scrap movement will be higher later in the current quarter and in the second quarter," he said. He warned that the threat of a steel strike would knock prices down in the final weeks of June.

The IRON AGE editor pointed out that while improved technology has made the mills less dependent on scrap, this did not mean that the scrap industry would not remain strong, and important to steel.

Stability Is Questionable — "I question also," Mr. Campbell said, "whether the less dependency on purchased scrap will necessarily give the scrap market or the steel industry a so-called better stability. It might, in the long run, even produce wider variations in prices and scrap movement than have already been the case."

This could come about, he said, through a breakdown of the scrap-collecting machinery due to lack of incentive.

Officers Re-elected — Mr. Chase and other officers of the institute were re-elected to one-year terms. Milton K. Mahler, Morrow Steel Co., Detroit, is first vice president; E. J. Moskowitz, Schiavone-Bonomo Corp., Jersey City, second vice president; Harry Marley, Abe Cooper-Syracuse Inc., Syracuse, N. Y., treasurer, and Ralph N. Kopelove, Kopelove Iron & Metal Co. Inc., Dayton, secretary. The 1960 convention will be held in Miami.

How Japan Underbids U.S. Mills

Here's how delivered-price bids of American and Japanese steel compare on recent orders of ship

plate for the U. S. Navy. Japanese steel was supplied by C. Itoh & Co., Inc., New York.

Tonnage	Price per ton		
	Japanese*	Low U. S. Bid	High U. S. Bid
153	\$137.00	\$149.80	\$181.00
107	\$132.00	\$153.00	\$190.00
102	\$132.00	\$148.00	\$186.00
108	\$173.00	\$186.80	\$199.00

*Includes duty but not 6 pct "Buy American" factor.

Why U.S. Navy Buys Japanese Plate

■ Since last November U. S. Navy buyers have ordered 5700 tons of ship plate and sheet from Japanese suppliers.

This tonnage is about 11 pct of all the sheet and plate bought in a year at the Navy's General Stores Supply Office in Philadelphia. It will be shipped direct to Navy installations all over the U. S. including Washington, D. C., Mare Island, Calif., Boston, Mass., and Norfolk, Va.

Handled by Broker—C. Itoh and Co., New York, was the bidder offering the Japanese steel. Production will be handled by the Yawata Iron and Steel Co., Ltd. and the Fuji Iron and Steel Co., Ltd.

Why did the Japanese get these Navy orders? They bid in quality product at prices from \$10 to \$45 a ton below the lowest American quote. (See table above.)

Navy purchasing agents are frank to admit price tells the story. "Purchases were made from Japan

because C. Itoh was the low responsive and responsible bidder," says Captain J. W. Bottoms, Commanding Officer, General Stores Supply Office, Phila.

Overcome Barriers — He adds that all steel is bought under Armed Services Procurement Regulations.

Before bids are compared the Navy (or the overseas supplier) must add import duty to the quoted price. Then 6 pct of a foreign bid is added to that bid under the "Buy American" Act.

Inspection Check — In some cases another ruling can take an order away from an overseas mill even when it is low bidder. If the lowest American bidder would make the product in a labor surplus area the proposed award must be submitted to the Secretary of the Navy for a decision.

Japanese mills must pass the same rigid inspection given American steel producers, the Navy says.

How Malleable Founders Plan Ahead

Despite prospects of better business in '59 (see below) malleable founders are not relaxing their sales, market development, and research efforts.

Here are some of the areas they are thinking about according to James H. Smith, general manager, GM's Central Foundry Div., Saginaw, Mich.:

More Malleable in Autos:

Especially promising is greater use of malleable castings for parts usually made in short-runs where forging dies are uneconomic. Door hinges are an example of a product recently converted to malleable and

now representing a 1500 ton a month market. Auto connecting rods are a prospective one.

Less Need for Annealing:

Malleable founders are experimenting on a new low temperature product which would reduce or eliminate present long and costly annealing cycles.

Shell Molding Research:

Researchers are looking for a less costly substitute for phenolic resin in shell molding applications. Right now costs can make this process impractical.

Isotopic Control: Radioactive isotopes could be used to control moisture and size in molding sand and for locating defects in castings.

Nuclear Energy: There's a possibility the physical properties of metals can be increased many-fold with the use of nuclear energy.

More Design Clinics:

Design conferences for castings users or prospective users have proved an excellent selling method. So far the GM conference at Saginaw, Mich. has attracted 1200 customers in 14 meetings. It is now going "on the road."

Founders Aim at Wider Markets

Business gains this year are expected by both gray iron and malleable foundries.

As sales weapon they rely on user clinics, technical handbooks, and better design and testing equipment.

■ After weathering a rough 1958, things are looking up for malleable and gray iron foundries.

This year malleable foundries are looking for an increase of 18-20 pct in business over '58, Richard W. Crannell, president of the Malleable Founders Society in Cleveland, told the group's semi-annual meeting. Mr. Crannell is also president of Lehigh Foundries Co., Easton, Pa.

Auto Market Important — This predicted increase assumes only a 10 pct increase in auto markets. With a five million car year, malleable production would hit 825,000

tons and with a six million car year, about 900,000 tons. Last year's production was 675,000 tons.

Gains for Gray Iron—Gray iron foundries are looking for shipments of about 12 million tons this year compared to an estimated 10.5 million for 1958, according to Donald H. Workman, executive vice president, Gray Iron Founders Society.

Last year's shipments were the worst since World War II. October shipments, however, were the best in a year. Increased shipments are expected this year for general machinery, construction, automotive and housing uses.

Pearlitic Moves Up—Biggest shot in the aim for malleable foundries this year will be facilities for turning out pearlitic malleable. Another is new design and testing equipment. About \$6 million will be spent during 1959 by 75 pct of the association members for new equipment.

Pearlitic malleable, stronger but more easily machined than regular malleable, has increased 480 pct in the past 10 years and now accounts for 20 pct of all malleable production.

Compared With X-Ray—Greatest interest at the meeting was in GM's Cobalt 60 inspection replacing conventional X-ray equipment. GM's installation cost about \$20,000 compared to \$200,000 for X-ray, thus putting it within reach of smaller firms.

New Handbook Coming—Malleable founders are also using an extensive research program and a new handbook in this year's sales battle. The book, according to Hans J. Heine, new technical director, will highlight such sparsely covered areas of malleable technology as machineability, and high temperature properties.

Autoworkers Get a New Ax

Workers Collect if Out-of-State Strike Closes Plant

Michigan Supreme Court says men are entitled to unemployment compensation as long as they were not struck.

Automakers say they may wind up subsidizing strikes against themselves.—By H. R. Neal.

■ Michigan's liberalized Supreme Court last week handed the United Auto Workers a new ax to hold over the heads of the manufacturers.

The court ruled that 11,500 Detroit area Ford workers can collect unemployment compensation for three weeks they were laid off in 1953 because of a strike at Ford's Canton, O., forge plant. Payments are estimated to total \$1 million.

Reverses Former Ruling—The Supreme Court decision reverses previous rulings of the unemployment compensation officials and a Wayne County (Detroit) Circuit Court judge. The Michigan court's decision is not without precedent. Eight or nine other states have ruled the same on this question.

But nowhere else could the decision work as effectively. Of all industries, probably only the automakers have concentrations of operations in one state that can effectively be halted by a strike in another.

Subsidize the Strike—While the UAW paid strike benefits to the few, the many could collect unemployment compensation—a benefit paid by the employer. The net effect would be to have employers subsidizing a strike against themselves.

Ford vice president and general counsel, William T. Gossett, called the decision "a matter of deep concern to Ford Motor Co., as it must be to every Michigan employer or to any prospective employer consid-

ering locating a plant in Michigan." Further, he condemned it as "a shattering blow to the principle of state neutrality in labor disputes."

Behind the Decision—Key to the issue was interpretation of the term "establishment." As previously applied in Michigan, since "Chrysler vs. Smith" in 1941, establishment meant all the functionally integrated plants of an employer.

Only General Motors of the Big Three automakers is not likely to get involved in a similar situation. The auto giant has had a section

in its contract, since 1940, which states:

"The union has requested this national agreement in place of independent agreement for each bargaining unit covered hereby. Accordingly an authorized strike in one bargaining unit under this agreement which results in an interruption of the flow of material or services to operations in any other bargaining unit under this agreement, will be considered an authorized strike in any such affected bargaining unit."

Diemakers Settle With UAW

Back in Business—Detroit's tool and die industry is again "ready to do business." The Automotive Tool & Die Manufacturers Assn., and UAW Locals 155 and 157 reached a contract settlement. Union members will vote on it on Sunday.

Negotiations dragged over nine months without much headway until Federal mediators brought the groups together. The result is a three-year contract in which the association gained significant concessions for its members.

Sets the Pace—While the association bargains for only about 75 of the larger shops, employing 7500 workers, their contract is usually accepted as the pattern. In the area there are several hundred tool and die shops, with 10,00 to 12,000 employees.

Most important immediate benefit is wages. There is no immediate increase. This shaves 15¢ from the 53¢ differential between the captive shops of the auto companies and the independent Detroit job shops.

Skilled employees will get 7¢ more an hour on Sept. 1, 1959, and other workers 5¢. Contracts with the Big Three call for 8¢ and 6¢, cutting the differential another cent. An 8¢ and 6¢ increase will be given on Oct. 1, 1960, the same as the auto companies.

Other Provisions—Employees now agree to work overtime on "emergency" jobs while men are still laid off. It also provides "flexibility" in work assignments while on overtime—a worker in one classification can be moved to another assignment for up to two hours, and can be shifted to yet another classification for another two hours, for a total of four hours of an eight-hour overtime day.

Settlement of the contract brought an almost immediate response from the auto companies. Apparently holding off until they knew whether or not a strike would hit Detroit tool and die shops, purchasing agents wasted little time in putting out requests for bids when peace was assured.

Good Year Ahead For Steelmakers

Output will be up, maybe enough to make 1959 the third best steel year ever.

There'll be no shortages, but watch out for tight spots.—By Tom Campbell.*

■ This will be a good year in steel. But it will be tough on two counts for steelmakers. Competition for available business will be intense. And steel management will face its Waterloo in its bout with labor.

More than 110 million tons of steel ingots will be poured this year.

It could run as high as 115 million tons. If so, it would rack up the third best year in steel industry history—output in 1955 was 117 million tons, in 1956 it was 115.2, in 1957 it was 112.7, and in 1958 it was 85 million tons. The days of acute steel shortages are over for awhile. Capacity is so great there is little chance of premium priced markets or daisy chain selling in 1959—or in 1960.

But there will be tight spots before next June 30 when the odds will be 65-35 for a 5 to 6 weeks' strike and the most bitter bargain-

ing table tactics in a decade. The much tighter delivery periods will begin to show up before the end of the first quarter. Already many steel companies have substantial backlogs because of a rush of orders from the automobile industry as 1958 came to a close.

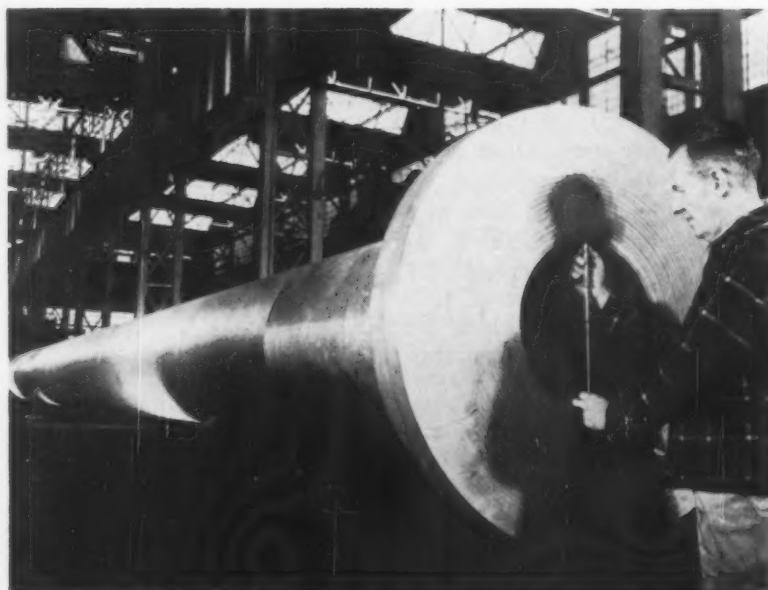
There is more than a 50-50 chance that the first quarter of 1959 will see a steel ingot rate of 75 to 80 pct of capacity. But by the middle of the second quarter the rate will be close to 85 pct and the average for the second quarter will approach 90 pct. The third quarter's rate could fall as low as 50 pct.

If there is a strike—and we think there will be a long one—steel operations in the fourth quarter of this year could reach 95 to 100 pct in some weeks, with the average between 90 and 95 pct. If there is no strike—though the odds favor one—the last quarter steel operations of this year could be in the lower 70's or upper 80's.

Additional support for the steel market—aside from hedge buying in the second quarter—will come from two laggards: The oil and gas industry will be in the market for much more steel this year. The other latecomer will be railroads.

*Editor in Chief, The IRON AGE. From an article in "The Exchange," published by the New York Stock Exchange.

Shaft for an Aircraft Carrier



GOING TO SEA: This tremendous fifty-ton steel shaft was forged by the Homestead Works of U. S. Steel Corp. It is one of four main propeller shafts for one of our newest aircraft carriers, the U.S.S. Independence.

It is one of the main factors in giving the ship a cruising range of

about 600 miles per day.

The shaft started as a steel ingot weighing 169 tons. Heat treating took two and one-half weeks. It now weighs 50 tons, and is 66½ ft. long.

The business end of the shaft will hold a propeller that is about as high as a two-story house.

Steelmaking in 1958

Output of 8,713,000 net tons of ingot and steel for casting in December was a factor in boosting total production in the U. S. last year to 85,257,363 tons, reports the American Iron and Steel Institute.

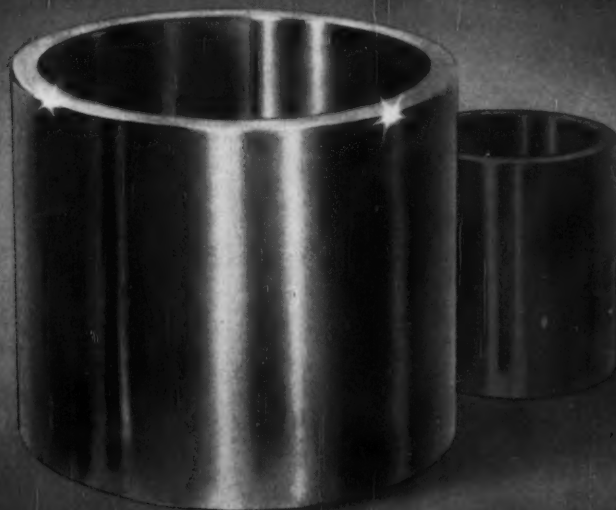
December output was topped only by October in 1958.

The fourth quarter was the best of the year. The 26,122,096 tons produced in the last three months also topped output in the last period of 1957.

introducing **NEW**

IRON OILITE 212 BEARINGS

**"bronze"
performance
at far
less cost**



The important difference between the porous bronze bearing (right) and the all-new Iron OILITE* 212 Bearing (left) is cost. While both bearings give long, maintenance-free service, Iron Oilite 212 bearings now open the door to major savings for many equipment manufacturers.

Performance-proved in life tests and on actual products, Iron Oilite 212 bearings have a service life equal to porous bronze when used for products where corrosion is not a problem and mechanical strength requirements are within tolerable limits.

A high oil content — approximately 20% by volume — assures adequate lubrication for the lifetime of many end products. In addition, a unique built-in service factor gives Iron Oilite 212 bearings extraordinary protection against temporary overloads. They perform best when carrying medium to heavy loads at relatively low speeds and readily equal the performance of bronze at the high speeds required by home appliances, fractional horsepower motors, power tools, light machinery and other products.

It's another Amplex first . . . a typical example of how Amplex serves a growing number of original equipment manufacturers with "better quality at lowest cost". Use Amplex's extensive research and engineering facilities to your own advantage. Savings can be impressive if you require bearings in volume.

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the most trusted name in powder metallurgy!

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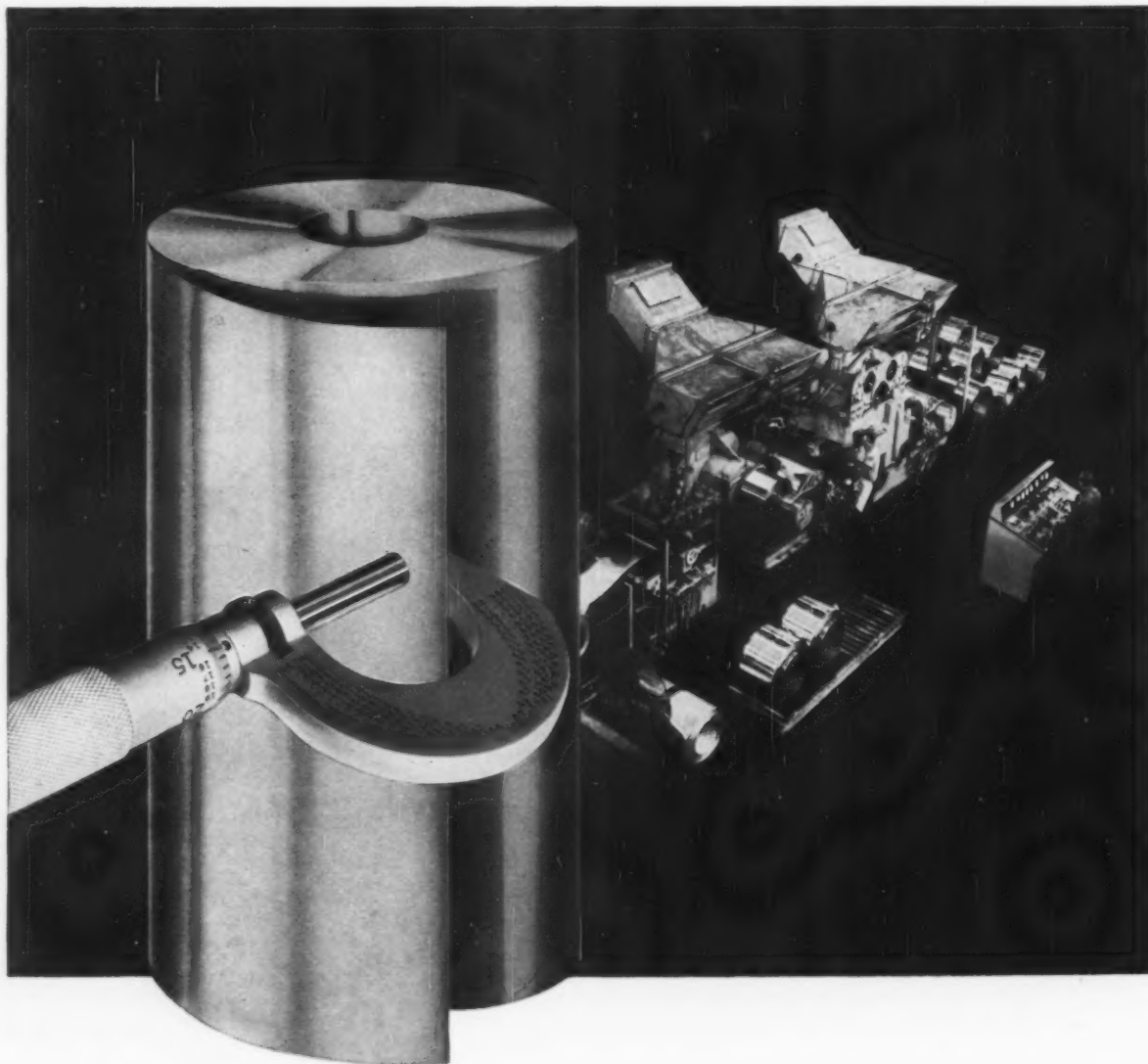
free sample

of IRON OILITE 212 Bearing 1" ID x 1 1/4" OD x 1" Length and full information on request. Consult the Oilite engineer in your area. Find him in the Yellow Pages under "bearings" or write direct to Amplex. Address Dept. R-1

COMPARISON OF TYPICAL PHYSICAL PROPERTIES

	Iron Oilite 212	Oilite Bronze
Porosity, % oil by volume	18 - 23	18 - 23
Ultimate Tensile Strength, (psi)	10,000	18,000
Compressive Yield Point, (psi)	9,500	20,000
Rockwell Hardness	RH - 35	RE - 65
Specific Gravity	6.1 - 6.5	6.4 - 6.7

When Brass Strip Tolerances Call For PERFECTION TO THE "Nth" DEGREE



Possibly, you've never seen—or even heard of—a Sendzimir Rolling Mill like the one pictured above. Not many people have. But if you use close-tolerance brass, copper or bronze strip, you'll certainly appreciate what these high-speed, precision units can do when you order Bridgeport Sendzimir-Rolled Strip.

These mills—now in operation at Bridgeport's plants—are capable of rolling light-gauge strip into economical, long-length coils to meet the most rigid gauge tolerances.

Bridgeport Sendzimir-Rolled Strip has other advantages as well. It has remarkable uniformity of gauge and mechanical properties from edge to edge and end to end. It also has a beautiful luster—all properties you can use to advantage in your own production.

Get details on Bridgeport Sendzimir-Rolled Strip today. Call our nearest Sales Office or write us Dept. 3401.



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Albert P. Gagnebin

Lab Man With a Knack for Sales

The notion that researchers and salesmen are necessarily opposite types doesn't hold true in this case.

After making his mark in metallurgy, this executive is making another in sales.

■ To nickel emissary Albert P. Gagnebin, a research scientist and a high-type salesman have several important traits in common. Both require a lot of curiosity, imagination, and honesty.

Mr. Gagnebin is in a good position to judge. Now vice president, International Nickel Company, Inc., he was both a research man for Inco and a sales executive before moving into the vice presidency. Among his more notable accomplishments: He is a co-inventor of ductile iron.

A Yale Man—A native of Torrington, Conn., the versatile, 49-year-old Mr. Gagnebin got his bachelor's degree in mechanical engineering from Yale University in 1930 and a master's degree in metallurgy in 1932.

After his graduate studies, he joined Inco's research lab at Bayonne, N. J., and devoted himself to research on ferrous metals. He was a member of the ductile iron section of Inco's Development and Research Div. in 1949, the year the metal was introduced.

Wins Founders Award—Since then, ductile iron has been hailed as the "bridge" between cast iron and steel. Production of the metal this year is expected to reach 500,000 tons and, says Inco, is likely one day to become the third-ranking industrial material tonnage-wise



A. P. GAGNEBIN: It helps to have curiosity, imagination, and honesty.

For his outstanding work in developing ductile iron, Mr. Gagnebin was named 1952 co-recipient of the Peter L. Simpson Gold Medal Award, by American Foundrymen's Society. During his years with Inco he wrote many technical papers and the book, "The Fundamentals of Iron and Steel Castings."

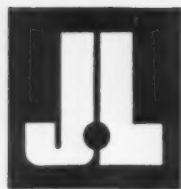
The Switch to Sales—Came the day when Inco decided Mr. Gagnebin could be a valuable asset in the sales department. He was named assistant manager of the Nickel Sales Dept. in 1955, and manager in 1956.

To unpretentious, quick-witted

Albert Gagnebin, taking the critical step from the lab to the sales office was no great problem. He was endowed with a fortunate capacity to handle people.

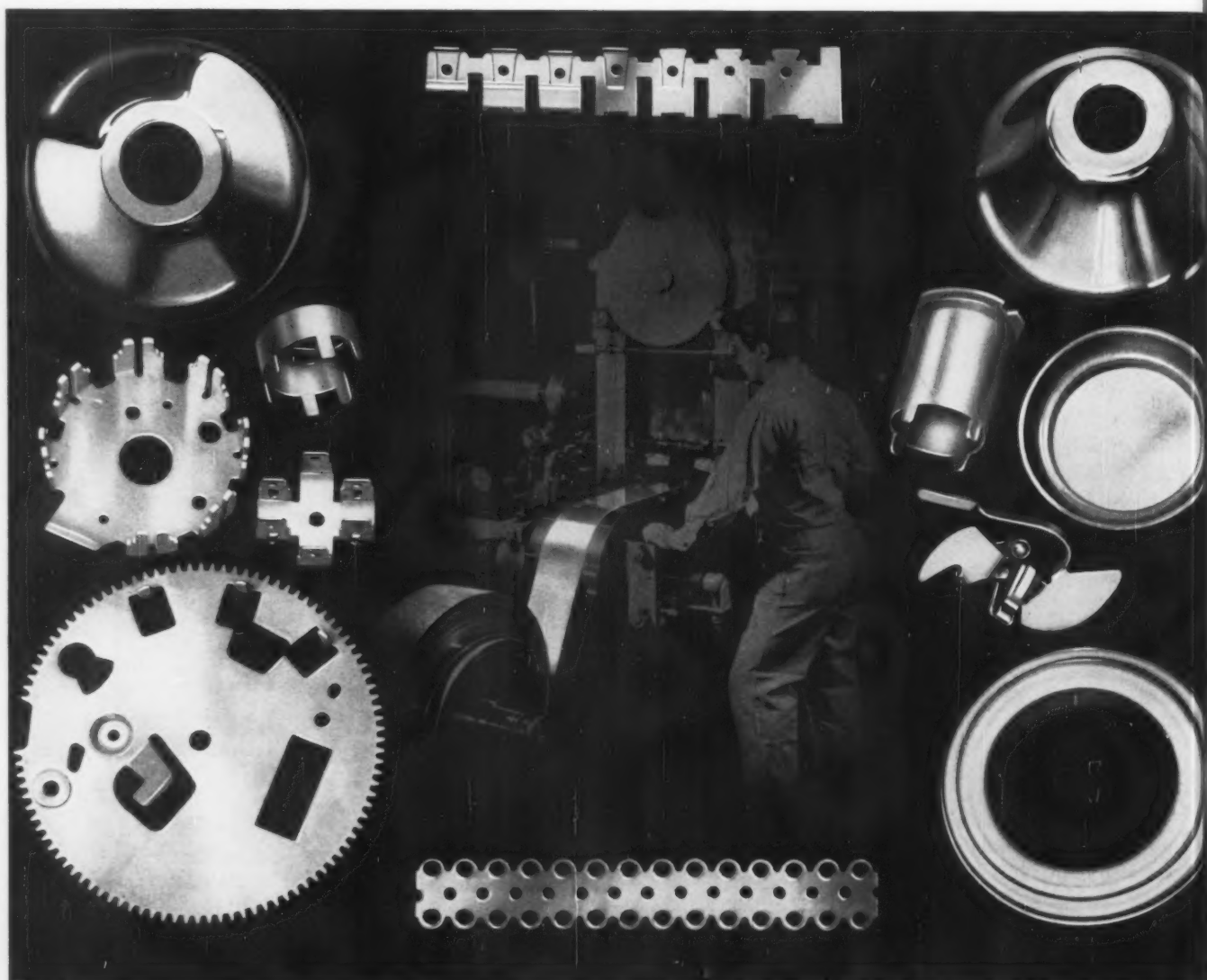
French Enthusiast—Of Swiss-French ancestry, Mr. Gagnebin is interested in just about anything concerning France. In 1951, at an International Metallurgical Conference in Brussels, Belgium, he presented a technical paper in the French.

Fluency in French, he says, gives him an insight into European metallurgy that is difficult to obtain through translation.



Precision

COLD-ROLLED STRIP STEEL



For Precision Products Of Strip Steel Use Engineered Quality

Jones and Laughlin Precision Cold-Rolled Strip Steel is produced to *your* specifications . . . designed to meet *your* particular fabricating requirements. The first cost is not always the most important . . . the end-product cost is the important consideration. By using J&L Precision Cold-Rolled Strip Steel, you may find, as others have, that your labor and machine costs can be reduced.

J&L Strip Steel is more than just another cold rolled strip steel. It is a specialty product produced by a specialty operation accustomed to working with unusual specifications. A precision product is usually needed to produce an unusual or special end-product.

J&L Stainless and Strip Division produces a full line of restricted and standard specification strip steel in these grades and types: Low Carbon • High Carbon
Tempered Spring Steel • Electrolytic Zinc • Alloy • Stainless



Let us engineer quality into your product.

Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Youngstown 1, Ohio

Keep an Eye on Local Taxes

State and local taxes can hit your business hard this year. Most communities need the money and many new taxes are likely.

But few will go to anti-business extremes if the case for business is presented properly.

■ The Federal budget gets all the headlines, but your company may have an even greater stake in state and local finances this year.

Almost every state and city face money problems. In most cases, the limits of present tax systems have been reached. The result will be a surge of bills and ordinances aimed at widening tax bases for needed revenue.

This will be in addition to the conventional methods of adding a cent here and a cent there to such old targets as cigarettes, gasoline and liquor.

Ounce of Prevention—You will have to be on the lookout for taxes that are outright anti-business. Some of these will be well-concealed, but your company—and its business association, if it has one—should be alert to take action.

However, anti-business taxes are not so easy to push through state legislatures as they were a few years ago. Case histories of fading economies in states that have overtaxed business are too well documented. Even legislators who might be considered in the pocket of labor are not anxious to pass restrictive taxes on business these days.

Accounting Problems—However, some tax measures could have an impact on business, even though they are not necessarily taxes on

business. For example, take the proposal in New York state to force businesses to withhold state income taxes:

Some authorities believe this would involve a major bookkeeping task, even to the point of requiring new office and payroll equipment.

Many cities are considering payroll taxes, or asking state legislatures to pass enabling laws to permit them. This method of raising city revenues has its pro's and con's, but again involves an entirely new element in payroll computing, as well as employee recruiting.

Keep in Balance — Few communities are going to escape new or higher taxes this year. There is little tendency anywhere to cut down on services and a lot of pressure to add to them. Business will have to pay, but you can work at keeping its share in balance.

There's a growing feeling that business has had it, as far as taxes go. With many states and communities offering tax and other concessions to lure business, your community may be more receptive than you think to the business point of view.

"Quickie" Labor Law Likely

■ Look for Congressional Democrats to push for quick passage of a moderate labor reform bill.

The measure, which will probably be close to last year's Kennedy-Ives bill, is aimed at short circuiting conservative moves to toughen up the Taft-Hartley act.

Sen. Kennedy is expected to introduce his rewrite job within a week or two, according to informed committee sources, with full committee approval expected shortly.

Board Studies T-H—Meanwhile, the Committee has appointed a board of non-government experts to study the entire Taft-Hartley act and make recommendations for a broad overhaul.

But while this board is working, backers of a "sweatheart" labor reform bill can blunt efforts for a tougher revisions by insisting that action await the board's report. This is likely to take several months.

In the House, fast approval of mild legislation is likely. This is

because Democratic leaders have packed the House Labor Committee with a 10-member majority. Conservative Chairman Graham Barden in the past has bottled up moves of this kind, but the wide majority makes this virtually impossible in the current term.

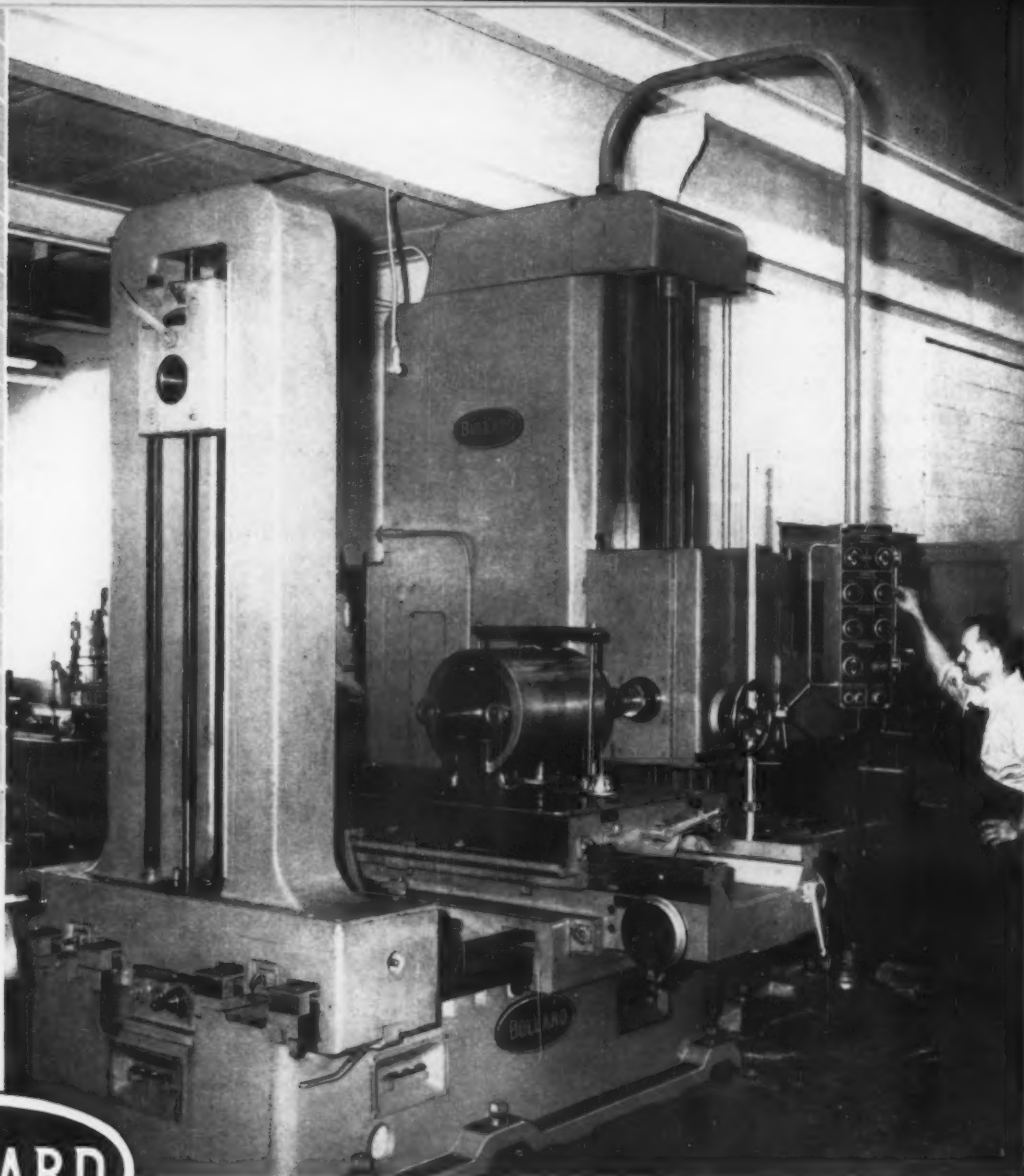
Business Failures: 1958 a Tough Year

The gloomy statistics on business failures show just how badly metalworking was hit in 1958.

Figures compiled by Dun & Bradstreet show that iron and steel manufacturing failures were up about 50 pct in 1958 from 1957.

All in all, 177 companies in this category went under in 1958, compared with 113 in 1957. Another group that was hard hit was machinery, with 294 companies failing in 1958, compared with 254 in 1957.

Total business failures for the year reached a new post-war high.



BULLARD

"It's Really **RUGGED** and Versatile"

"In our business," says Mr. Stanley McDonald,
Plant Foreman of E & M Enterprises, Inc. of Middleport, New York,
"building special machinery for a wide segment of industry, we needed
a horizontal boring machine that was rugged, accurate, faster,
easy to set up and control. We decided that the Bullard H.B.M., Model 75
best met our requirements. Now, after more than two years of operation,
we're convinced we made the *right* choice and bought the *right* machine."

*A call to the nearest Bullard Sales
Office or Distributor will convince you
that the Bullard H.B.M., Model 75
is the right choice for you.*

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT

Crisis Coming in Smog Battle

Automakers Get Ultimatum From Los Angeles Mayor

"Desmog your cars or 1961 models will be barred from sale in California."

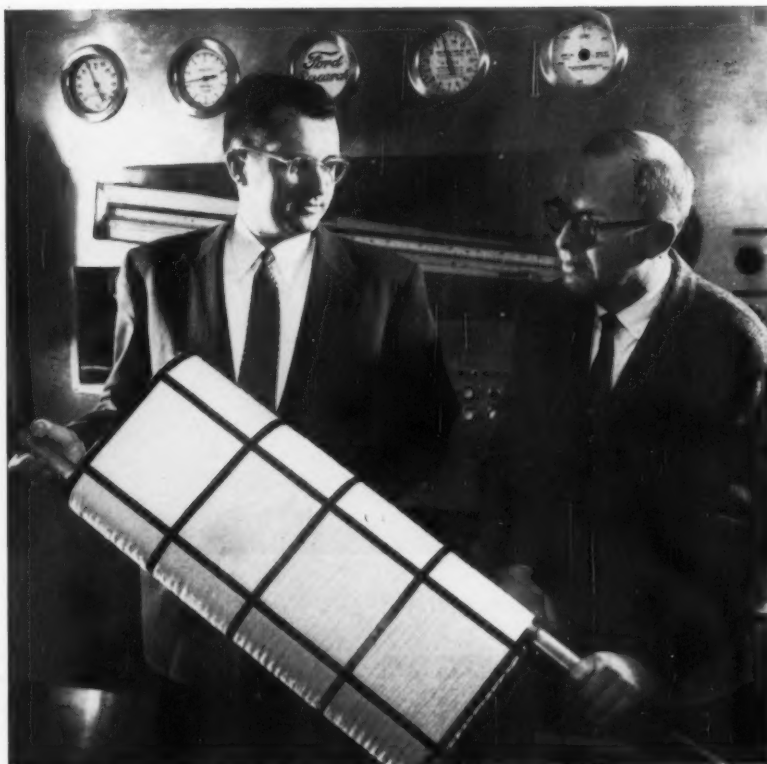
That's the substance of a warning issued by Mayor Poulson.—By H. R. Neal.

■ Through tear-reddened eyes, Los Angeles Mayor Norris Poulson declared war on the automobile industry a few weeks back. Smarting under a now-usual attack of smog—a combination of smoke and fog—the mayor laid the blame squarely on the doorstep of Detroit's best known product, the automobile.

Rallying the forces of local government behind him, a bill has been introduced into the California Legislature which would bar the sale of 1961 model cars which haven't been desmogged. At the same time, he said he had canceled his order for an executive Cadillac, was instead switching to a smaller car—Rambler. His reasoning: A smaller engine produces fewer hydrocarbons, therefore contributes less to the smog. (His council decided to stay with the larger gasoline burners.)

Boxed-in Region—Smog is peculiar to the Los Angeles area because of its unique environment. Surrounded on three sides by towering mountains which block cleansing winds and on the fourth side by the ocean from which the winds blow, the city lives under a "temperature inversion" most of the year.

A temperature inversion occurs when there is a layer of warm air covering the cooler air of lower levels. The walls formed by the



FORD'S ANSWER: The muffler displayed by James M. Chandler (l.), and R. T. VanDerveer, of Ford Motor Co.'s engineering research office, is called a catalytic converter. It purifies smog-causing exhaust gases.

mountains and the sea breezes put much of Southern California in a box—with the lid closed. Elsewhere, these conditions are said to exist only in two places in Africa and one in South America—all without a concentration of people, industry, or automobiles.

Sunshine Reaction—There is also a larger-than-normal concentration of ozone in the atmosphere due to the "perpetual" sunshine. Normally, hydrocarbons in gases from factory smoke, burning of refuse, and automobile exhaust are

harmless because they are quickly carried away by the winds. But in the box, they react with sunlight and put the sting in smog.

The one uncontrolled source of these hydrocarbons is automobile exhaust, according to Mayor Poulson.

Market in Jeopardy—Has the mayor's threat caused any concern within the automobile industry?

You can bet it has. Los Angeles County had a population of 5,598,000 in 1957. At the same time it had 2,275,972 passenger cars and



Another Tinnerman Original...

Tinnerman Push-On **SPEED NUTS**[®] fasten with a "bite" that can't shake loose

In a split-second, this low-cost Tinnerman Push-On SPEED NUT arches its spring-steel back, then bites hard to make a positive attachment on unthreaded studs, rivets, tubing, nails, jewels, small housings.

Application is easy—finger pressure starts it; a push with a simple hand tool locks it under live spring tension. No threads to worry about, no spot welding, no riveting, no special inserts, bushings or washers necessary. Elimination of extra parts and assembly operations may save you up to 50% or more in fastening costs.

Push-On SPEED NUTS lock on everything from thermoplastics to die-cast, chrome-plated steel. Hundreds of variations to fit any shape or size stud—from very small diameters to larger rectangular shapes. Some Push-Ons have "caps" that cover exposed shaft, axle or stud ends.

Check Sweet's Product Design File, section 8-T. Or look under "Fasteners" in the Yellow Pages and call your Tinnerman representative for complete information and samples. Or write to:

TINNERMAN PRODUCTS, INC.
Dept. 12 • P. O. Box 6688 • Cleveland 1, Ohio

TINNERMAN
Speed Nuts[®]



FASTEST THING IN FASTENINGS[®]

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerospace Ltd., Treloar, Wales. FRANCE: Simmonds S. A., 3 rue Solomon de Rothschild, Survaux (Seine). GERMANY: Mecano-Buddy GmbH, Heidelberg.

Automotive Production

WEEK ENDING	CARS	TRUCKS
Jan. 17, 1959*	134,042	21,542
Jan. 10, 1959	133,362	22,564
Jan. 18, 1958	109,761	18,627
Jan. 11, 1958	120,140	17,928
TO DATE 1959	292,335	47,620
TO DATE 1958	277,501	44,428

*Preliminary

Source: Ward's Reports

272,516 trucks. There was one passenger car for every 2.5 persons—the highest ratio in the country.

With more cars and trucks than anywhere else in the country, the industry wouldn't like to be frozen out of this market—even temporarily. The level of concern among automakers is apparent from the fact they have already spent over \$5 million studying the problem and seeking a solution.

A Breakthrough?—The industry is willing to admit, unequivocally, that automobile exhaust is to blame. But Harry A. Williams, managing director of the Automobile Manufacturers Assn., says reports presented at the winter meeting of the Society of Automotive Engineers indicate a "breakthrough" in the industry's search for ways to reduce engine exhaust that "may contribute to Los Angeles smog."

Work on the problem has moved from basic research to the engineering development and road testing stage. Engineers have developed three types of experimental exhaust treatments capable of reducing hydrocarbon emissions from 60 to more than 90 pct, "under various test conditions."

Cost Is Problem—The reports, however, pointed up serious operational complications requiring a great deal more testing before any of the methods can be considered dependable enough for commercial use. One problem is cost. Present estimates range from \$100 to \$200, depending on the method selected.

Two of the methods, a flame-type afterburner and a low-temperature catalytic converter designed to oxidize or burn up hy-

drocarbon fumes, have been developed into complete automobile exhaust system prototypes. The third system is a high-temperature catalytic converter. All of the devices have been tested on automobiles under operating conditions.

Most Promising—Ford Motor Co. engineers, reporting on the low-temperature catalytic system which uses vanadium pentoxide as a catalyst, said the device attained over-all test operating efficiencies of 60 to 73 pct in removal of hydrocarbons.

Considered to be the most promising of the systems, it is only slightly larger than a standard muffler. From 25 to 30 lb of pellets $\frac{1}{8}$ in. in diam, each coated with the catalyst, are used in the "muffler." The catalyst has a useful life expectancy of about 10,000 miles, which Ford men believe must be extended to 15,000 or 20,000 miles for practical application.

Fan-Belt Driven—Adding to the original cost of the converter is the necessity for introducing "secondary air" to assure an oxidizing

atmosphere. In the test, this was done by employing a regular air compressor, belt-driven from the fan pulley.

The low-temperature converter is being fabricated in a large enough quantity to permit simultaneous proving ground tests by all automobile manufacturers.

Flame-Type—Another system reported on in detail is a flame-type afterburner developed by Thompson Ramo-Woolridge, Inc. This system is more complex than a catalytic converter and requires a larger "package," but is capable of removing some 90 pct of the hydrocarbons in automobile exhaust.

GM's System—General Motors engineers reported on the high-temperature catalyst system which in tests achieved an efficiency of from 75 to 90 pct. Heavy stainless steel construction is used in the device. One drawback is weight—95 lb.

GM engineers said there were still some problems to be solved before the system could be adopted.

The Bull of the Woods



...and for
**GRINDING
THE
CENTER
SECTION**



CINCINNATI'S Automatic Features are Additional Time Savers

Multiple diameter shafts and multiple operations are often inseparable. The shafts being ground on the CINCINNATI FILMATIC 10'R Plain, above, are typical examples. They require three types of setups: straight traverse, taper traverse, and infeed. The center section is the infeed operation, with a 4" wide wheel. Two automatic features control cycle time:

- 1) push-button automatic infeed 2) automatic gap eliminator

The latter feature automatically compensates for variations in stock allowances. ¶ Traverse grinding operations are equally low in cost and high in quality. Reasons why include rapid stock removal, a well-known Cincinnati advantage . . . FILMATIC grinding wheel spindle bearings (self-adjusting for every setup) . . . automatic grinding wheel balancing . . . smooth hydraulic table traverse (reverses next to shoulder within .004"). ¶ Many additional advantages are offered by Cincinnati for grinding multiple diameter work, or any other work within the range of the machine. A simple cost analysis . . . your present equipment vs. a new CINCINNATI . . . can be most revealing. Catalogs G-661-1 and G-660-2 will help you in making a comparison. Write for copies.

GRINDING MACHINE DIVISION

The Cincinnati Milling Machine Co., Cincinnati 9, Ohio

Cincinnati's automatic infeed grinding cycle and automatic gap eliminator are deciding factors in reducing the cost of grinding precision multiple diameter shafts. A CINCINNATI FILMATIC 10'R x 36" Plain Grinder performs the various operations.

CINCINNATI FILMATIC 10'R Plain Hydraulic Grinding Ma- chine. Range and sizes listed below.

Size	Between-Center Lengths	Catalog
6" R } 10" L }	18" and 30"	G-660-2
10" R } 14" L }	18", 36", 48" 72" and 96"	G-661-1

Sweet's Machine Tool File contains brief specs.



CINCINNATI®

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES
MICRO-CENTRIC GRINDING MACHINES • CHUCKING GRINDERS
ROLL GRINDING MACHINES • CENTERLESS LAPPING MACHINES

Move to Broaden Veto Powers

Aim Is to Let Ike Kill Only Part of Money Bills

Senators Byrd and Bush say this would give Ike the weapon to block excessive spending.

But the tide in Congress is opposed. It would doom many pet projects.—By G. H. Baker.

■ Some cost-conscious senators want to give the President closer control over questionable federal spending. Their answer: Give Ike the right to veto individual items in any money bill approved by Congress.

Mr. Eisenhower asked for this early in January, in his state-of-the-union message to Congress.

Precedent in States — Although some state legislatures let their governors kill an item in an appropriation bill, the U. S. Congress has always forced presidents to accept or reject an appropriation bill as a package.

Sens. Byrd (D., Va.) and Bush (R., Conn.) are leading the charge for the change. But Senate opinion is opposed to the plan.

Most congressmen fear that giving the power of selection to a president would doom many of their pet spending projects.

How This Works — A senator who had successfully talked his colleagues into voting federal dollars for a bridge or dam in his bailiwick would be in danger of seeing this stricken from an appropriation bill by a money-conscious president.

Congress May Control Consumer Credit

Congress is again considering federal controls over consumer credit.

If pending plans become law, the

Federal Reserve Board would be authorized to revive its Regulation W, which includes stricter down-payment requirements, and shorter periods of time to pay off the balance.

Cut Down Buying—Such a move would greatly restrict the sale of automobiles and other consumer goods. While the requirements called for in Regulation W have varied in the past, the Federal Reserve Board has usually required consumers to pay as much as one-third down and the balance in a year or a little more.

Such terms, imposed on the buying public today, would take thousands of would-be customers out of the market. It would mean a sharp fall-off in sales of automobiles,

household appliances, furniture, housewares, and many other consumer items.

Aim at Price Cutting

The "good faith" defense for price discrimination is being threatened again.

Sen. Estes Kefauver (D., Tenn.), and 18 co-sponsors will push a bill to ban all price discrimination regardless of motive. Such a bill failed in the last two congresses.

The Current Rule — The bill would void a 1951 U. S. Supreme Court decision which permits a firm to cut prices to some customers if it is done to meet competition.

The case involved Standard Oil Co. of Indiana.

Labor Moves to Block Moves

Try to Stem the Tide — Labor officials are going to try hard to stop—or at least slow down—the moving of divisions, departments and even whole plants from strong union areas.

Moving to low-cost areas is simply management's way of trying to improve its competitive position, of course. To the south or west real estate, rent, labor, and taxes are usually less costly. New plants and new machinery are clearly more efficient than the old. Lower unit costs of a firm's products result.

Labor Loses Members — Labor leaders concede all this, but they bitterly resent the loss of members that sometimes results. A union may

exercise complete control over the labor force of a firm in Cleveland or Detroit, for example. But if the firm moves to the largely non-union South, the union loses members and their dues.

Here's how unions will fight back: They'll demand, in some contracts up for renewal this year, that firms planning to move to non-union areas offer to take along all union members who want to go. All moving costs would be borne by the company. And workers who elect not to go would receive generous severance pay.

Unions will push this plan hard. If they succeed there'll be fewer plant moves.

puts that "want-to-buy" gleam
in their eye



UNILOY

STAINLESS STEELS

The gleam in *her* eye reflects the brilliant beauty of stainless steel trim. The gleam in *his* eye reflects the protection that only stainless steel provides. Helps keep that "showroom look" for years.

Specify Uniloy stainless steel, produced by steelmakers who have been making specialty steels since 1884. This backlog of experience explains Uniloy's gleaming finish, why it is so easy to fabricate. For prompt delivery of Uniloy stainless steel rolled to your exact specifications, write or call our nearest sales office or warehouse.

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STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE METALS

Selling Guide for the Farwest

Latest Report on New and Expanding Plants

The range of products made in the West keeps expanding every month.

And these manufacturers are prospects for metalworking goods and services. — By R. R. Kay.

■ Are you getting your share of business in the big southern California market?

If not, here's the latest report on new and expanding plants—and what they make. In the Farwest the range of metalworking products widens every month.

These manufacturers are all good prospects for metalworking equipment, materials, and services.

Swim Gear, Doors, Valves—Steel containers — U. S. Steel Products Div., Los Angeles. Swimming pool equipment — Swimquip, Inc., El Monte. Custom sheetmetal equipment for restaurants, institutions, and hotels—Doubarn Sheet Metal Co., Los Angeles.

Fire doors — C. L. McCluney, Inc., Los Angeles. Metal stamping and orthopedic supplies — Trio Metal Stamping Co., City of Industry.

Hydraulic valves for aircraft—Hydraulic Research & Manufacturing Co., Burbank. Metal packing and crating materials—Nash-Hammond & Co., El Monte.

Plated Parts, Rocket Controls—Control systems for rockets—Automatics Div. of North American Aviation, Downey. Hard chrome plating—Chromal Plating Co., Los Angeles. Machine shop—Omega Design Associates, North Long Beach.

Aluminum die casting—W. L. Chapman Co., Pasadena. Aluminum finishing, and makers of plating jigs and fixtures—Richards Rack Co., Lynwood. Chromium plated and brass plumbing fixtures—Price-Pfister Brass Manufacturing Co., Pacoima. Machine shop—Lockard Tool & Engineering Co., Lynwood.

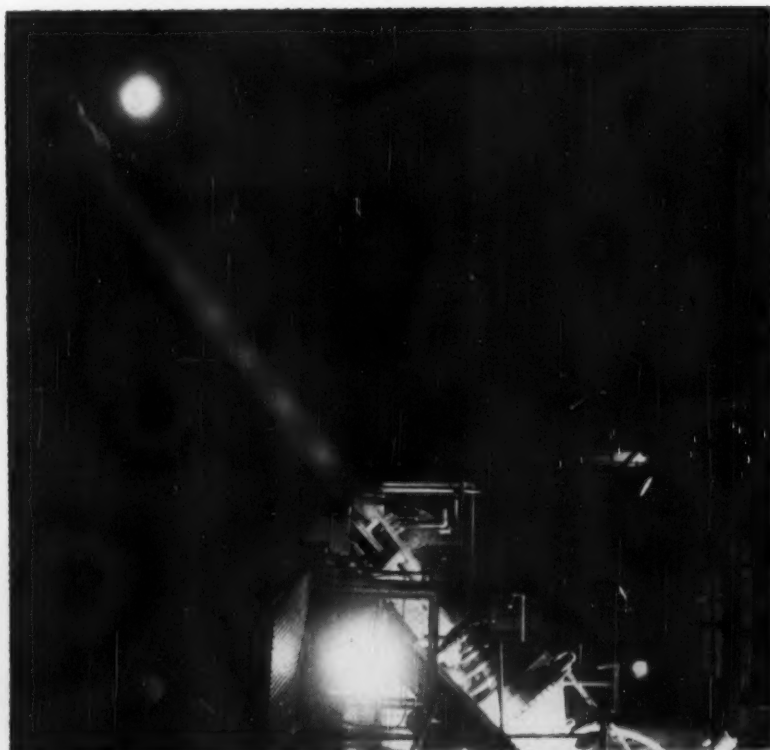
Grinding service—Hyatt-Sayler, Inc., Pico-Rivera. Manufacturers of disk grinders and aircraft parts—Rankin Bros., Lynwood. Airborne navigation and control equipment—Astronics and Learcal Divisions

of Lear, Inc., Santa Monica. Testing instruments — Endevco Corp., Pasadena.

Furniture, Tools, Cabinets — Cabinet hardware—Swenson Manufacturing Co., Downey. Containers — Zero Manufacturing Co., Burbank. Trencher buckets and digging teeth — Jetco, Inc., Alhambra. Chassis and cabinets for electronic industries—Pacific Metal Products Co., Sun Valley.

Steel fabrication—R. E. Atkinson Co., Azusa.

Step Toward Nuclear Rockets



NOZZLE TESTED: Firing tests are conducted on nozzle of Kiwi-A—first reactor developed for nuclear rocket propulsion. Rocketdyne Div. of North American Aviation designed and built the firing nozzle.

SIMONDS ABRASIVE CO.

DIAMOND WHEELS

THE COMPLETE LINE IN EVERY RESPECT

Man-Made or Natural Diamonds

All standard shapes, sizes, diamond depths and concentrations... man-made or natural diamonds in resinoid and vitrified bond. Natural diamonds also in metal bond.

The new "man-made diamond" wheels, especially popular for grinding cemented carbides, average up to 35% more efficiency on the basis of cubic inches of carbide removed per cubic inch of wheel wear.

Specify "man-made diamonds" from SIMONDS... and get the best in diamond wheels for carbide tipped tools, chipbreakers; electrolytic grinding, surface grinding, lapping and hand honing.



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PORTLAND, ORE. • SAN FRANCISCO • SHREVEPORT

CALL YOUR SIMONDS DISTRIBUTOR



Proven products
dependable know-how
quick supply

A Drill Press Will Tap, Too

Simple Conversion Is Worth While, Says Expert

Reversing motor and other accessories will adapt a standard drill press for tapping.

It's done occasionally, but Delta's Eldridge offers good reasons why it should be done often.
—By E. J. Egan, Jr.

■ Did you ever put a reversing motor on a drill press so you could use it as a tapping machine? It's done—occasionally.

Ben Eldridge, metalworking products manager, Rockwell Mfg. Co.'s Delta Power Tool Div., thinks it should be done more often.

Here Are Advantages—Here are his reasons:

For a starter it gives you a specialized machine for one-fourth to one-half the cost of a machine designed for tapping.

A reversing motor gives you more capacity than tapping attachments. These are generally limited to diameters of $\frac{3}{4}$ in. and smaller. Driving the attachment consumes 20 or 25 pct of the available horsepower.

Multiple Tapping — Direct tapping helps in using multiple-head accessories to tap several holes simultaneously. The reversing motor meets greater power requirements more easily because there is no friction clutch and no lost power.

It takes no special skill to avoid breaking taps. After the tap starts to work, feed is controlled by the lead of the tap—not by the operator. Work is started either by manual feed or a pneumatic feed device.

The tap provides its own lead, and the machine transfers practically no thrust to the tap. Tapping action is sensitive; there is no "shav-

ing" of threads and they have maximum fidelity to the taps used. This advantage is apparent in all materials, especially aluminum, magnesium, and plastics.

Longer Tap Life — Tap life is increased because only a rotating force is applied.

When the drill press isn't used for tapping, it may be used for standard drilling and reaming.

How to Convert a Press — To convert a drill press to a tapping

machine, Eldridge says you need 1) a reversing motor; 2) a control station with a "drill"- "off"- "tap" selector switch, and an emergency stop button; 3) a tripper arm attached to either the drill press stop or the quill itself. This will actuate limit switches at the top and bottom of spindle travel. Also needed, 4) a reversing magnetic starter.

Eldridge says several companies make kits with everything needed to convert a drill press to a useful production tapping machine.

Mite Heavy for a Mirror



FINE GRINDING: Sample ground on a Heald 30-in. rotary surface grinder has a 2-4 microinch finish. It's flat to 0.0001 in., in 30 in.

INDUSTRIAL BRIEFS

Refractories Plant—Wm. S. Lowe, president, A. P. Green Fire Brick Co., Mexico, Mo., has announced plans for construction of a new \$2 million plant for the manufacture of basic refractories at Tarentum, Pa., about 20 miles northeast of Pittsburgh.

Mental Lightning—Minneapolis-Honeywell Regulator Co. has entered the medium-scale computer field with a new transistorized system called the Honeywell 800. The system is capable of doing data and scientific computation work simultaneously.

Newest in New England—Enthone, Inc., subsidiary of American Smelting & Refining Co., has completed a new research laboratory at its main plant in New Haven, Conn. The laboratory will conduct both basic research and applications research programs. It will also probe deeper into metal finishing problems.

Inland Plans to Spend—Inland Steel Co., Chicago, plans \$50 million of new financing, primarily to supply working capital required for its expanded operations and in part to provide for more capital equipment. The company said in its registration statement that additional capital outlays of \$80 million are contemplated in 1959.



"It's so automatic you don't dare butt in."

Up a Quarter—Connors Steel Div., H. K. Porter Co., Inc., will construct new steelmaking facilities at its Connors Works in Birmingham. The modernization will cost about \$500,000 and increase annual ingot output by about 25 pct. Expansion includes construction of a pouring building with a 25-ton crane and pouring car equipment.

Work for Mesta—The Mesta Machine Co., Pittsburgh, will design and manufacture steel strip coiling and handling facilities for the 44 in. hot strip mill at the Indiana Harbor Works of Inland Steel Co. of Chicago.

Canadian Tubemakers—Page-Hersey Tubes, Ltd., Toronto, Canada, will soon start producing copper tubing, and eventually expects to produce pipe and tubing made of aluminum and alloy steels. The Canadian firm has concluded an agreement with New Rochelle Tool Corp., New York, for exclusive Canadian rights for the production of welded copper tubing.

Three for One—An Industrial Division of American-Standard has been created by consolidation of the American Blower, Kewanee Boiler, and Ross Heat Exchanger Divisions. President of the Industrial Div. is J. W. Brennan, who will maintain offices in Detroit.

Bigger and Better—The Cleveland Cap Screw Co., Cleveland, has expanded warehousing operations in Philadelphia and Chicago by moving to new headquarters in each city. The Philadelphia sales office and warehouse is located at 4237 N. 2nd St., and the Chicago office and warehouse is at 133 S. Racine Ave.

New Name, Same Place—Assets of Colorado Fuel & Iron Corp.'s Perforating Dept. at the Clinton, Mass., plant of Wickwire Spencer Steel Div., have been sold to the Fitchburg Screen Plate Co., Inc., Fitchburg, Mass. President of Fitchburg Screen Plate Co., E. H. Hall, and his associates have formed a new company, to be known as National Perforating Corp.

Turnpike Location—Carpenter Steel Co., Reading, Pa., has purchased ground in Fort Washington Industrial Park adjoining the Pennsylvania Turnpike. Carpenter will erect on the site a building for use as office and service center for the Philadelphia-Delaware Valley area.

Honing Tool Venture—National Automatic Tool Co., Inc., Richmond, Ind., has purchased The Jes-Cal Co. of Fraser, Mich., manufacturers of honing tools. Natco, builders of multiple spindle machine tools, plans to develop, build and sell a machine of advanced design to utilize the size-control honing tools manufactured by Jes-Cal.

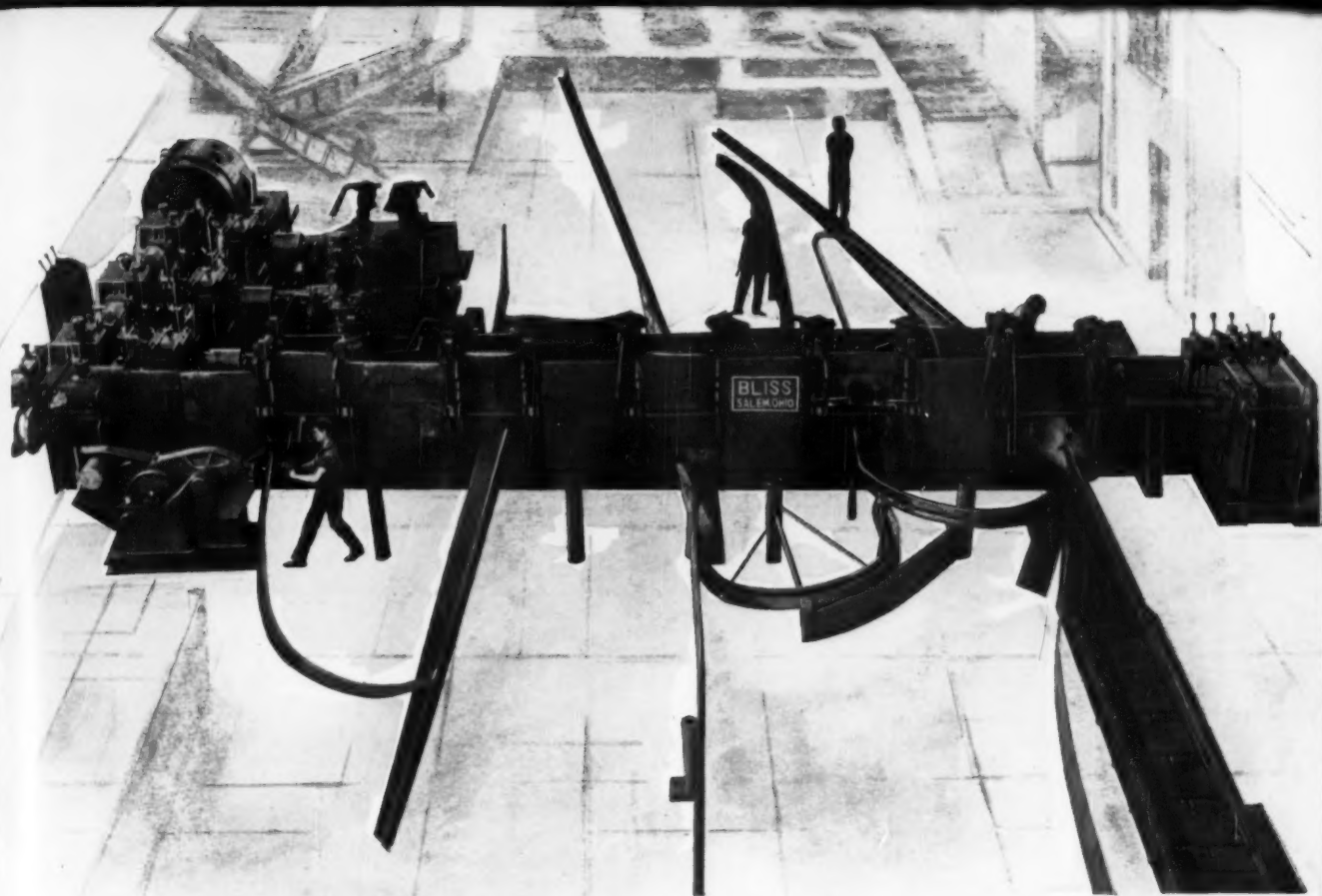
Forty-Year Man—I. Milville Stein, president, Leeds & Northrup Co., has completed his fortieth year with the Philadelphia manufacturers of electronic controls, instruments and heat-treating furnaces. He joined the organization as a sales manager.

Medal for Metallurgist—Clyde Williams, metallurgist and former president, Battelle Memorial Institute, has been awarded the James Douglas Gold Medal of the American Institute of Mining, Metallurgical and Petroleum Engineers. Formal presentation will be made Feb. 18 during the institute's national meeting in San Francisco.

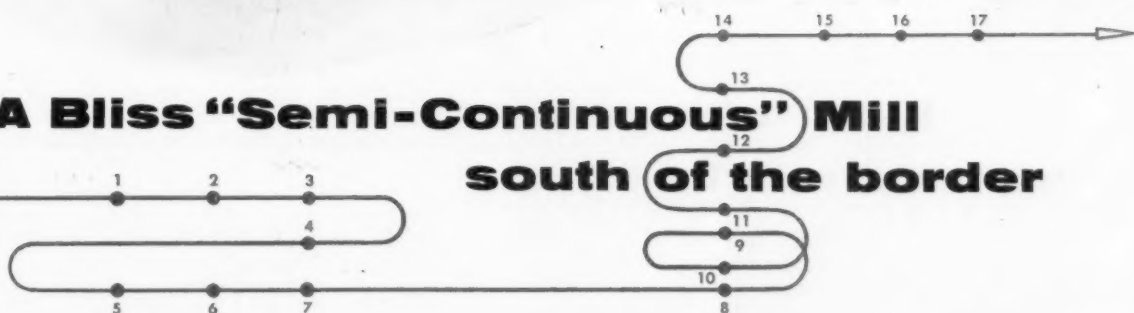
Busy as Bees—The M. C. Gill Corp., plastics laminators of South El Monte, Calif., is constructing facilities to enter metal honeycomb construction for the aviation and missile industries.

Homeward Bound—The Hunter-Douglas Aluminum Corp., Riverside, Calif., and Flemington, N. J., a wholly owned subsidiary of Bridgeport Brass Co., has been integrated into the parent company. Facilities will be known as the Riverside plant and the Flemington plant of Bridgeport Brass Co.

Ryerson Handles Reynolds—Joseph T. Ryerson & Son, Inc., steel distributor, has added Reynolds aluminum to the stocks carried at its Cleveland plant.



A Bliss "Semi-Continuous" Mill south of the border



Mexican cotton growers no longer need to import their baling strip, thanks to this new Bliss 11-stand Semi-Continuous mill recently put into operation by Aceros de Chihuahua, S. A.

Although the mill was primarily designed for production of narrow hot strip for cotton baling, Bliss and Aceros engineers designed it with an eye towards other uses too: as a result, the mill is suitable for production of rod and small shapes. Above all, it is simple to operate and easy to maintain.

Most of Aceros' requirements were handled by Bliss: the equipment moving billets in and out of the

furnace, mill entry, the three stand tandem roughing mills, 12 x 30" and two 12 x 24" intermediate stands, a three-stand finishing train, and most of the auxiliary equipment, including repeaters, terminal equipment and scrap baller.

In essence, the mill represents the wedding of the best of American and Mexican steelmaking "know-how". In this as in so many other installations, Bliss "tailored" its mill to the particular needs of the operator. For other examples of Bliss mills around the free world, write for our new 84-page Rolling Mill brochure, Catalog 40-B.

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E.W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio

Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio

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- 2. A SPECIAL SERVICE . . .** As an alternate plan, your old rectifier can be returned to Udylite for *factory* installation of the silicon replacement stacks by trained rectifier specialists. At the same time, your rectifier will be completely overhauled and tested so that it will be returned to you renewed and ready for the longer life and high efficiency of Udylite silicon.
- 3. A SPECIAL VALUE . . .** This whole program is set up as a Project Alert. A special department will handle your order and your equipment from start to a completely satisfactory finish. A *guaranteed delivery* will keep your down time to a minimum. With prices based on a production line plan, you will get more value per dollar spent than you ever before thought possible.

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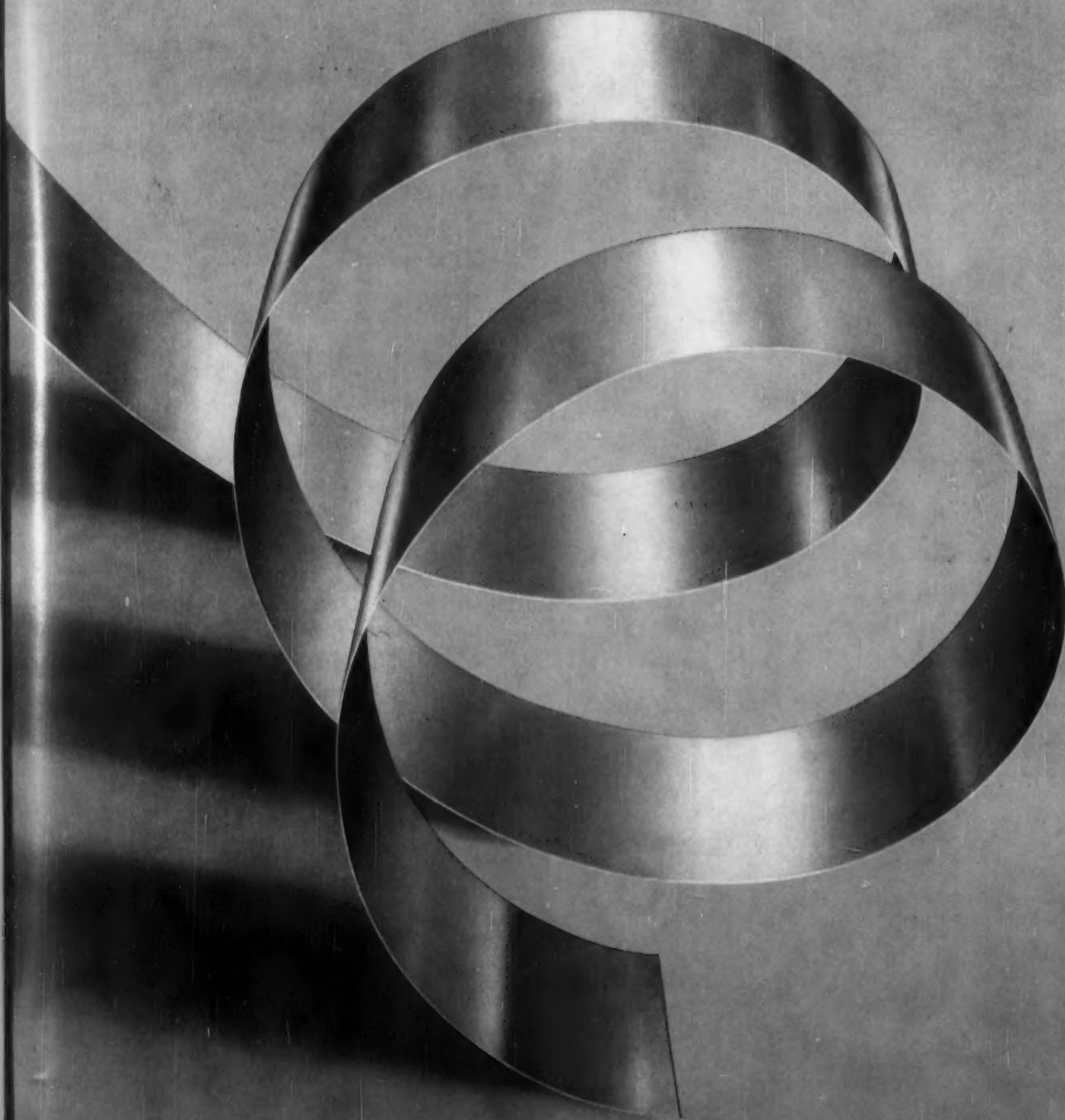
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less is available in all gauges down to .010" and in all widths. Write to *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*



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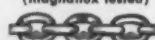
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S. W. Goodenough, appointed manager, Chicago district sales, American Steel and Wire Div., U. S. Steel Corp.

J. A. Parsons, elected president, Ward Steel Co., Cambridge, Mass.; **E. H. Allbee**, and **L. E. Palmer, Jr.**, named vice presidents.

A. H. Jones, elected vice president, sales and engineering, The W. W. Sly Mfg. Co.

E. L. Goff, named senior vice president, Associated Spring Corp., Bristol, Conn.; **W. E. Froehlich**, becomes vice president, engineering; and **F. E. Crist**, becomes director of administration.

J. B. Kopp, promoted to vice president, operations, and **J. R. Moran**, promoted to vice president, industrial relations, The Ingalls Iron Works, Birmingham, Ala.



C. W. Cravens, named manager, Cleveland steel plant, Republic Steel Corp.

F. B. Jewett, Jr., elected executive vice president, Vitro Corp. of America; **W. B. Hall**, named vice president.

D. A. Wrigley, appointed asst. general manager, Riverside-Alloy Metal Div., H. K. Porter Co., Inc.

Lovell Shockey, named sales manager, Cleveland Works, National Malleable & Steel Castings Co.

W. E. Thomas, appointed assistant to vice president, operations, The United Engineering & Foundry Co., Pittsburgh.

A. C. Olsen, appointed plant controller, Universal - Cyclops Steel Corp.'s Bridgeville, Pa., plant.

S. K. Scovil, appointed manager, Ore Sales Dept., The Cleveland-Cliffs Iron Co., Cleveland.

W. J. Scharffenberger, appointed asst. comptroller, Wheeling Steel Corp., Wheeling, W. Va.

A. W. Brandmaier, appointed director, European operations, Consolidated Electrodynamics Corp., Pasadena, Calif.

E. G. Boehm, appointed asst. general manager, Buffalo Bolt Co., division of Buffalo-Eclipse Corp.



A. H. Williams, Jr., named vice president, Reynolds Aluminum Sales Co., Richmond, Va.



N. W. Blakely, appointed general manager, Benwood Works, Wheeling Steel Corp., Wheeling, W. Va.

H. F. Kaiser, appointed divisional superintendent, Republic Steel Corp.'s Canton, O., steel plant; **R. C. Moore**, named superintendent, blooming mill; **H. C. Johnston**, named asst. superintendent, blooming mill.

W. A. Garrett, named asst. general manager, Brainard Steel Strapping Div., Sharon Steel Corp., Warren, O.; **J. W. Angell**, named assistant to general manager, charge of products; **J. D. Boyer, Jr.**, manager, field engineering; **F. S. Seybert**,



K. E. Hall, named vice president, Reynolds Aluminum Sales Co., Richmond, Va.

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chief engineer, industrial and plant engineering and tool and product development; **R. A. Wolschlag**, promoted to field sales manager.

J. O. Alexander, appointed market manager, packaging machinery, Reynolds Metals Co.

R. H. Perkins, appointed West Coast manager, Los Angeles office, Farrel-Birmingham Co., Inc., Ansonia, Conn.



P. C. Ely, appointed asst. vice president, operations, National Tube Div., U. S. Steel Corp.

G. P. Maurer, becomes director, gear engineering, The Falk Corp., Milwaukee; **W. S. Richardson**, chief engineer; and **E. J. Wellauer**, named director, research and development.

C. L. Catt, named manager, production and material control, Atkins Saw Div., Borg-Warner Corp.



R. M. Trent, elected president, Pangborn Corp., Hagerstown, Md.



Dr. Albert Muller, appointed vice president, Air Reduction Sales Co., the industrial gases and welding products division of Air Reduction Co., Inc.

G. A. Crittenden, named district sales manager, New York office, Pratt & Whitney Co., Inc., W. Hartford, Conn.; **V. H. G. Wadlund**, named district manager, Philadelphia office; **D. A. Heaton**, named district sales manager, cutting tool and gage sales activities in Philadelphia.

Dr. G. B. Cooper, appointed research supervisor, Jones & Laughlin Steel Corp.



W. L. Davidson, appointed sales manager, Engineering Works Div., Dravo Corp., Pittsburgh.

C. W. Diven, Jr., appointed assistant to the president and manager, customer relations, Sharon Steel Corp., Sharon, Pa.

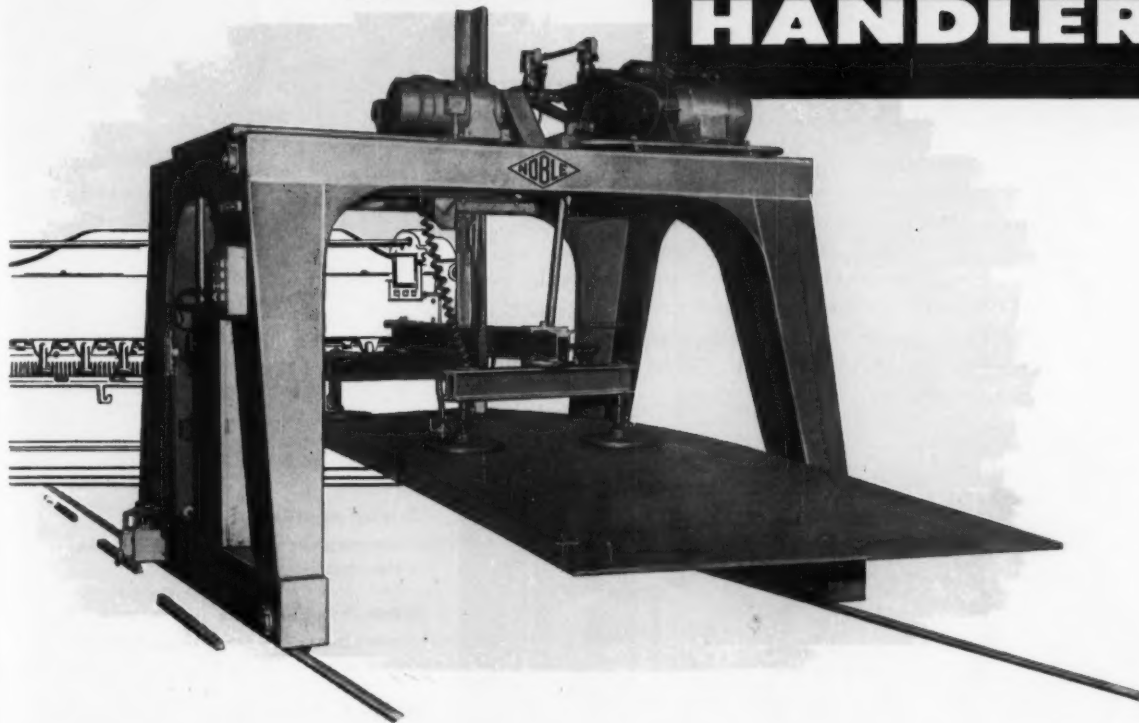
R. B. Gillooly, appointed asst. manager, sheet sales, Wheeling

How to Make Your Shear a Production Tool

-ADD A

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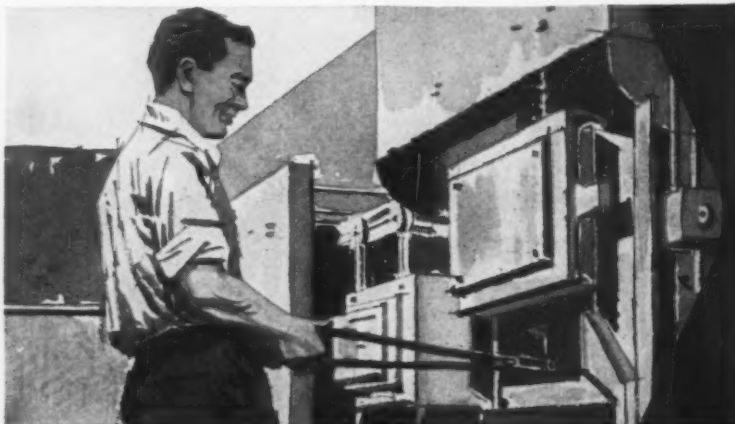
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PRESCRIPTION**

from 3 angles . . .

**EFFICIENCY, SUITABILITY,
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gains 3 benefits . . .

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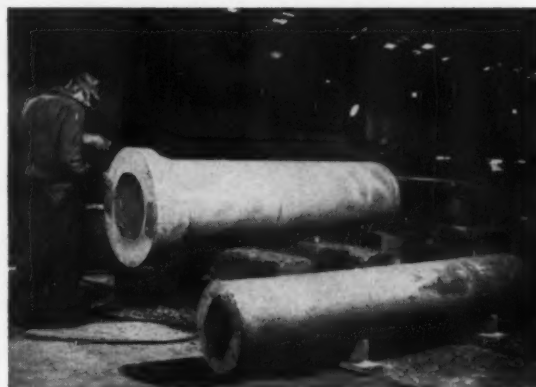
Make your first profit move NOW. Use Republic's 3-Dimension

METALLURGICAL TEAMWORK PRODUCED THESE COMPETITIVE ADVANTAGES

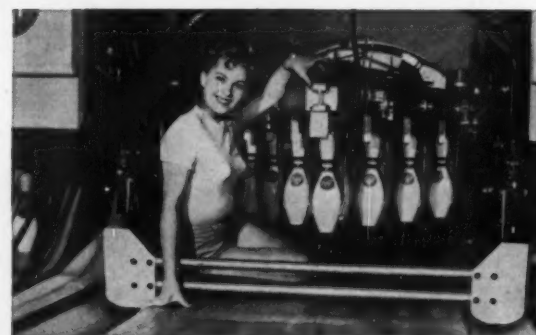
Metallurgists of Bendix Products Division, Bendix Aviation Corporation, undertook a program to improve processing deficiencies of steels used for aircraft landing gear. Republic was consulted and the program outlined. Republic's 3-D Metallurgical Service Team went into action. The field metallurgist worked closely with Bendix personnel right in their own plant under actual operating conditions. Findings were supplemented and co-ordinated by two other members of the Republic team — the laboratory and mill metallurgists. The result: development of a new grade of steel, ideal for landing gear application to withstand shock, impact, strain, and vibration.



On the advice of a Republic Pig Iron Metallurgist, Atlantic Foundry Company, Akron, Ohio, switched to Republic Chateaugay Pig Iron as the base metal for ram and cylinder castings used in hydraulic presses. The result: stronger castings, higher wear-resistance, better machinability, and the decided competitive advantage of passing along a 21% saving to customers. Atlantic's Vice President of Iron Foundry Operations says, "Another thing we like about Republic, aside from the year-in, year-out uniform chemistry of Chateaugay, is the Field Engineering Service you give. When we have a foundry problem and put in a call for help, your metallurgical engineers are Johnny-on-the-spot, talking a language we can understand. Then it's not long before the problem is solved."



At the suggestion of Republic's Steel and Tubes Division, American Machine and Foundry Company is saving \$34,000 in manufacturing the famous AMF pinspotter. They had been using steel tubing that required a boring operation on each end and centerless grinding on the O.D. Because Republic ELECTRUNITE® Mechanical Tubing easily met tolerance requirements, AMF was able to eliminate boring and grinding operations. This meant an immediate \$15,000 savings in fabricating. Another \$19,000 was saved on the cost of ELECTRUNITE compared with the tubing previously used. In uniformity, in quality, in fabricating, and in original cost ELECTRUNITE Mechanical Tubing could save you money, too. Call your Republic representative, or send coupon.



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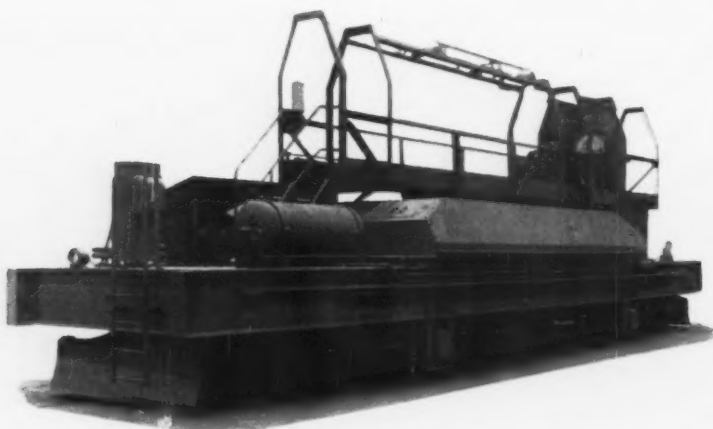
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Steel Corp.; **F. J. Howie**, appointed manager, Wheeling district sales; **W. G. Pursell**, appointed a resident salesman at Kansas City.

E. R. Mateer, named asst. controller, The Youngstown Sheet & Tube Co., Youngstown, O.

J. P. Bacon, appointed manager, tubing specialties products, National Tube Div., U. S. Steel Corp., Pittsburgh; **J. H. Degnan**, named manager, oil country tubular products and **G. O. Nations**, becomes manager, standard pipe products.

T. W. Kelly, appointed sales manager, Chicago Div., Lamson-Sessions Co.

John Tope, appointed asst. district sales manager, Birmingham, Ala., sales district, Republic Steel Corp.

Dr. Patrick Conley, appointed manager, Air Arm Div., Westinghouse Electric Corp.

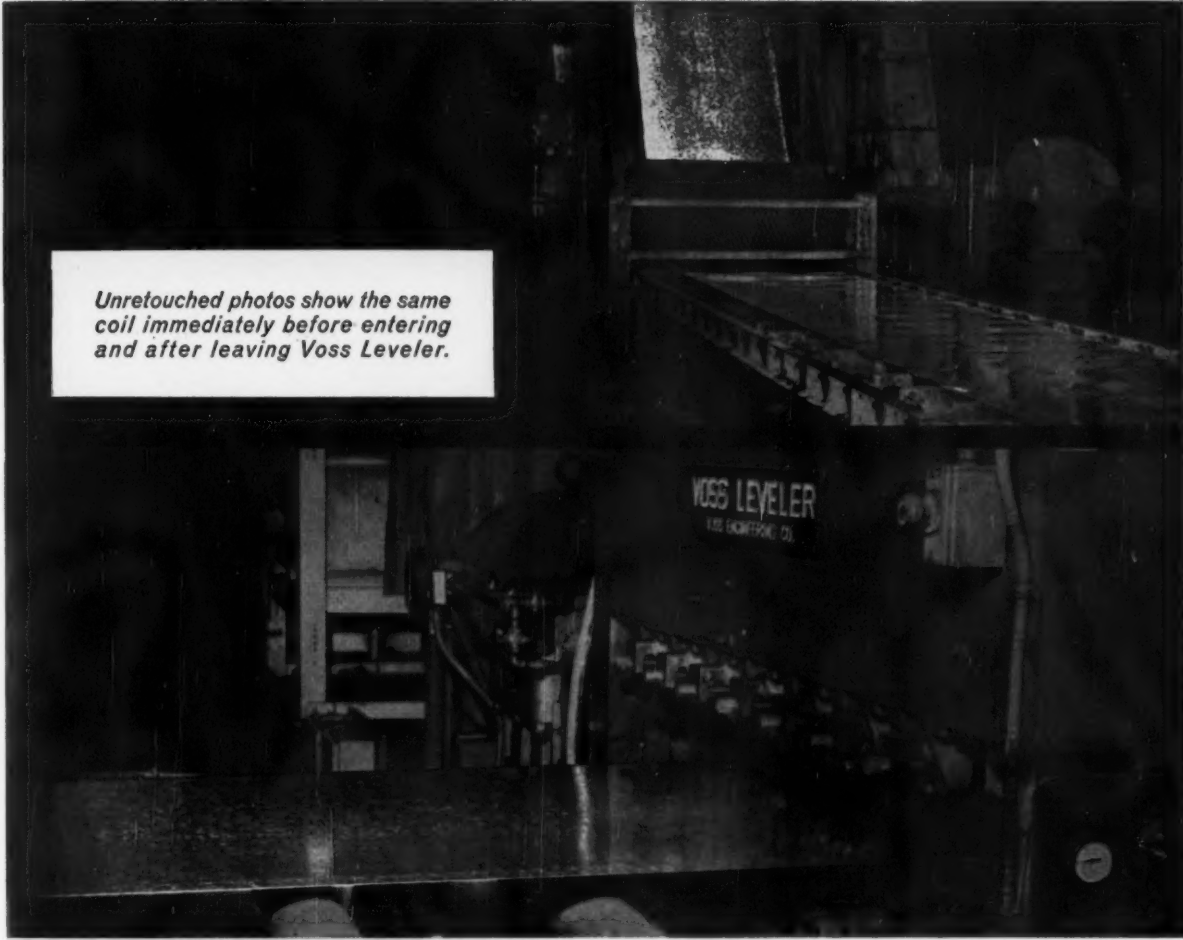


F. S. Napoli, appointed vice president, manufacturing, Dumont Aviation Associates and its Manufacturing Affiliates, and general manager, Du-Air Screw Corp. of Southern California.

OBITUARIES

W. S. Brackett, vice president, engineering, Union Carbide Chemicals Co., div. of Union Carbide Corp.

F. L. Pritchard, 61, district sales manager, Ohio territory, Industrial Products Div., Brown & Sharpe Mfg. Co.



Unretouched photos show the same coil immediately before entering and after leaving Voss Leveler.

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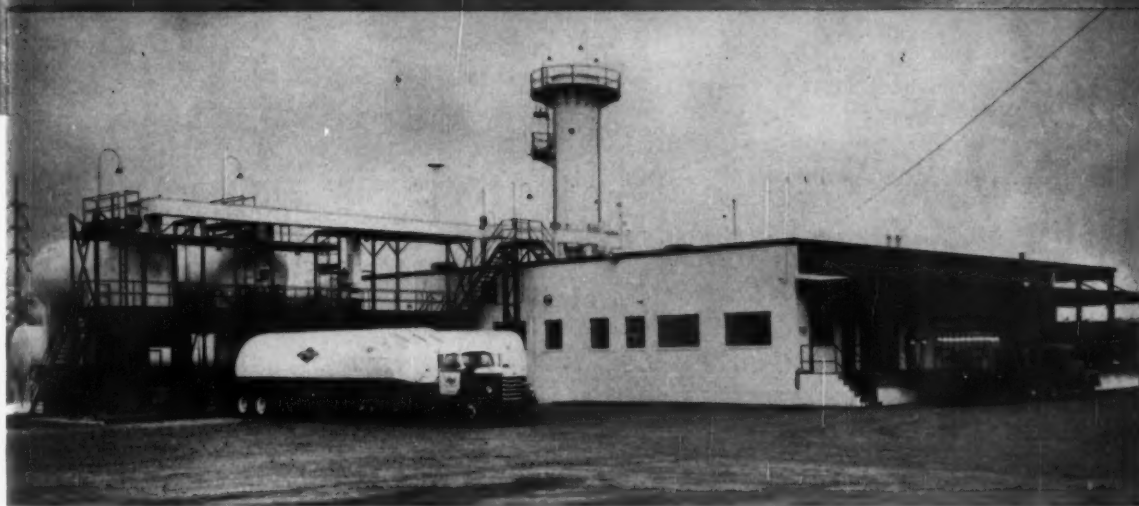


AMERICAN MESSER CORPORATION

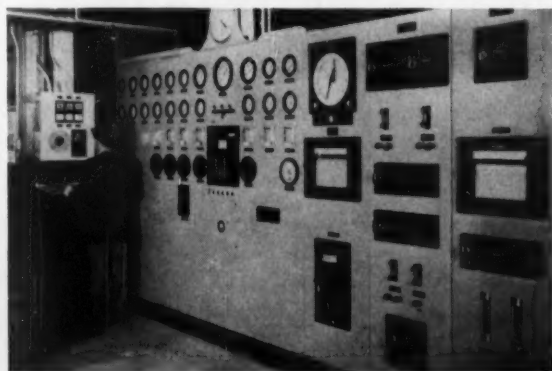
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"THERE IS NO SUBSTITUTE FOR MESSER EXPERIENCE"

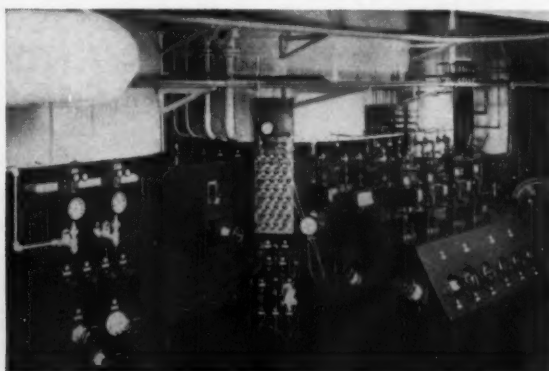
Chose **MESSER** Oxygen Plant



HIGHLY EFFICIENT . . . View of the Urbana, Ohio plant showing the Messer fractionating column extending above the building.



CONTROL PANEL indicating, recording, and controlling all important process variables shows the high degree of instrumentation typical of Messer plants.



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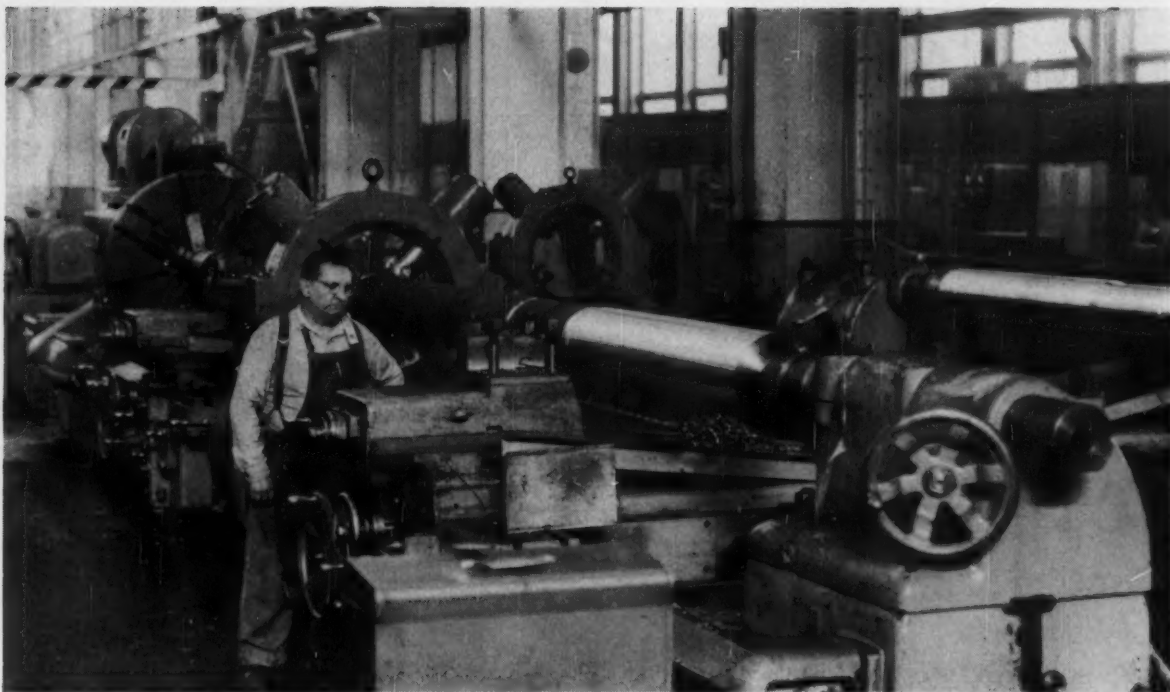


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GOING STRONG: Ceramic tool rough turns 120-mm gun forging with ease, taking cuts from $\frac{1}{4}$ to $\frac{5}{8}$ in. deep.

Ceramic Tools Take on Big Job

Speed Rough Turning of Gun Forgings at Watervliet Arsenal

By J. W. Rodd and G. A. Hutson—Project Engineers, Watervliet Arsenal, Watervliet, N.Y.

Don't be too quick to consign ceramic tool tips to the "finish-cut" category.

Here's the way to mount them to take deep, rough cuts at heavier feeds, higher speeds.

■ Ceramic cutting tools — ingeniously cushioned against shock by thin bits of aluminum foil—have tripled the stock-removal rate on one of the toughest machining jobs at the Army's Watervliet (N.Y.) Arsenal.

The job: Rough turning alloy steel forgings for 120-mm tank guns.

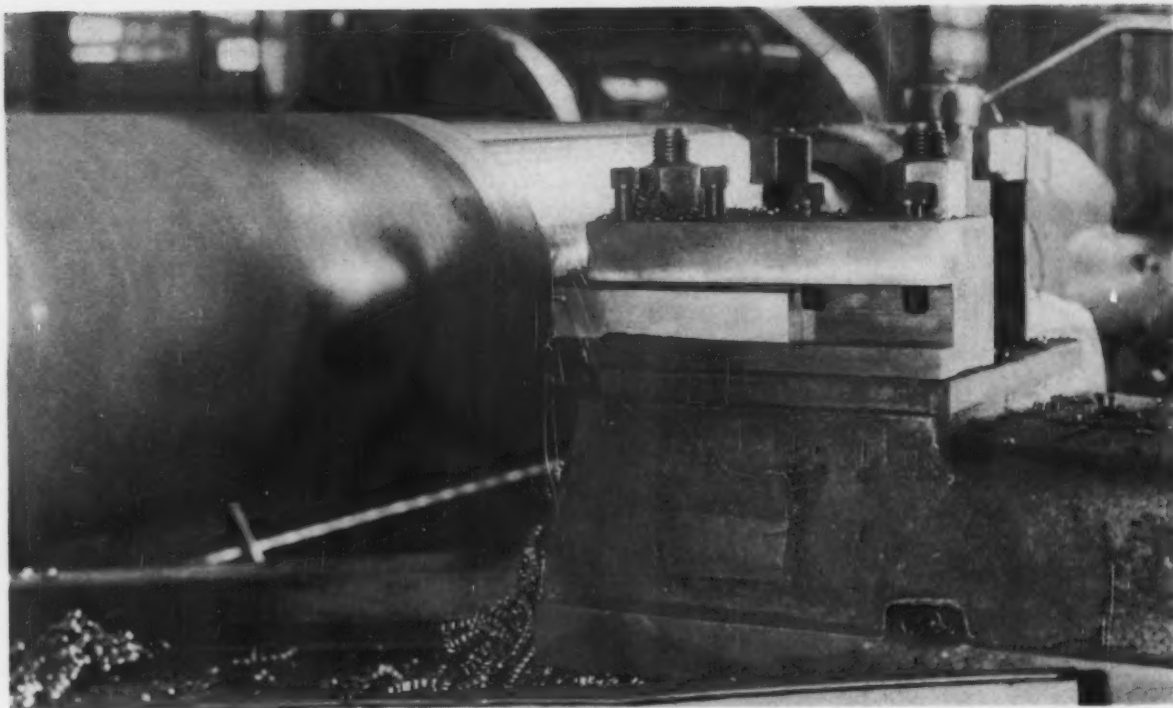
Notoriously hard to machine, these forgings are made from a modified 4330 formula. They're 24 ft long and vary in diameter from $11\frac{5}{8}$ in. at the breech end to 8 in. at the muzzle extremity. Tensile strength in the hardened and drawn condition is 180,000 psi. Hardness is from 38-42 Rc, with occasional harder spots measuring 45-48 Rc.

On the rough turning operation, the average life of a cutting edge on a premium grade carbide tool is 130 linear in. This is at a feed rate of 0.022 ipr and a cutting speed of 150-180 sfpm.

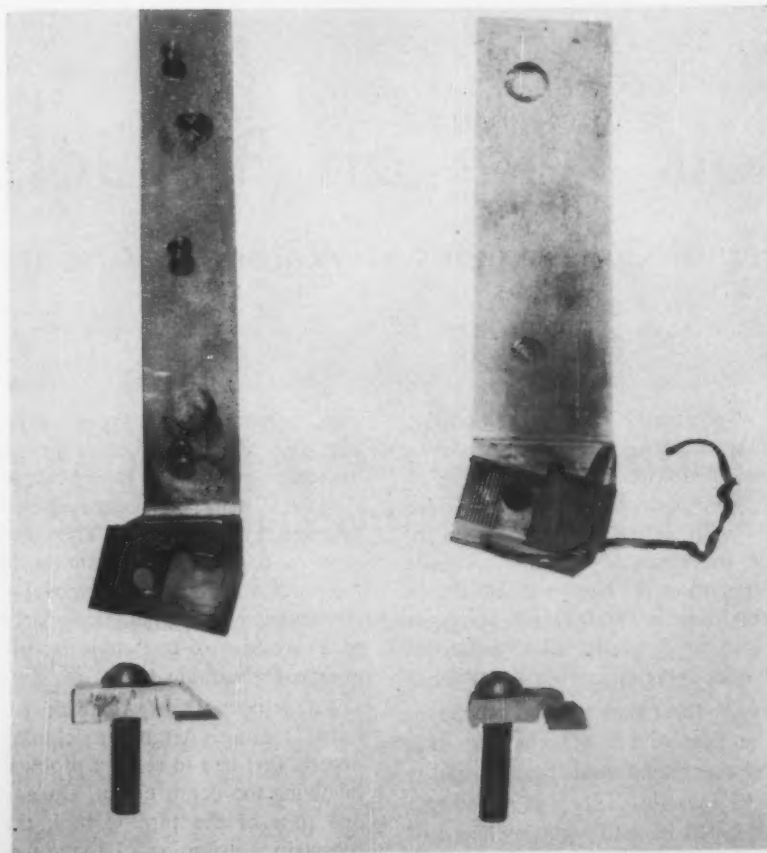
Ceramic Cuts More—By con-

trast, ceramic tools have an average edge life of 300 linear in. on the same operation, at a feed rate of 0.017-0.020 ipr and increased cutting speed of 380 sfpm. They also show a considerable advantage in the volume rate of stock removal—three cubic in. per minute compared to an average of one cubic in. per minute for carbide tools.

To achieve this gain with ceramic tooling, Arsenal machining experts first had to solve a problem involving the depth of cut. On any one pass of the turning tool, the eccentric distribution of the rough stock makes the cut depth vary from $\frac{1}{4}$ to $\frac{5}{8}$ in. This variation im-



THE RIGHT WAY: Good tool geometry and cutting edge placed at the work centerline will yield good results.



FOIL IS KEY: Shown with chip breakers removed, foil-cushioned tip (left) is in excellent shape. Uncushioned tip (right) is badly fractured.

poses probably the most severe stress the shock-sensitive ceramic material must withstand.

Foil Provides Answer—The problem was solved by putting a shim cushion of 0.0015-in. thick aluminum foil between the ceramic tip and the carbide seat of the tool holder. The foil compensates for surface irregularities at the interface of the tip and tool holder. It also provides a greater area of surface contact at this interface.

The use of ceramic tooling also solved a troublesome deflection problem on this job. It's one of the difficulties encountered in turning long workpieces. Deflection occurs when the temperature of the workpiece, and consequently its length, increase as a result of the cutting action.

A rather unique advantage of ceramic tooling is its ability to reduce this temperature-expansion-deflection effect drastically. The ceramic tip tends to transmit cut-generated heat to the chip rather than to the workpiece or toolholder. As a result, the forging does not expand its length to any marked

degree (which might ordinarily be expected with higher stock-removal rates).

One Setup Does It—Thus it is no longer necessary, as it was with carbide tooling, to continually adjust the lathe centers and steady rest throughout the turning operation. A single adjustment at the time of loading now suffices for the complete turning cycle. As a companion benefit, centers and roller rests require less maintenance attention.

The square, wafer-like ceramic tips are clamped in standard, heavy-duty, mechanical tool holders which are modified to accommodate carbide backup plates and serrated, adjustable chip breakers. The negative angles that can be readily obtained with these holders offer the greatest support to the cutting tip. The serrated chip breaker arrangement is helpful in distributing clamping forces equally.

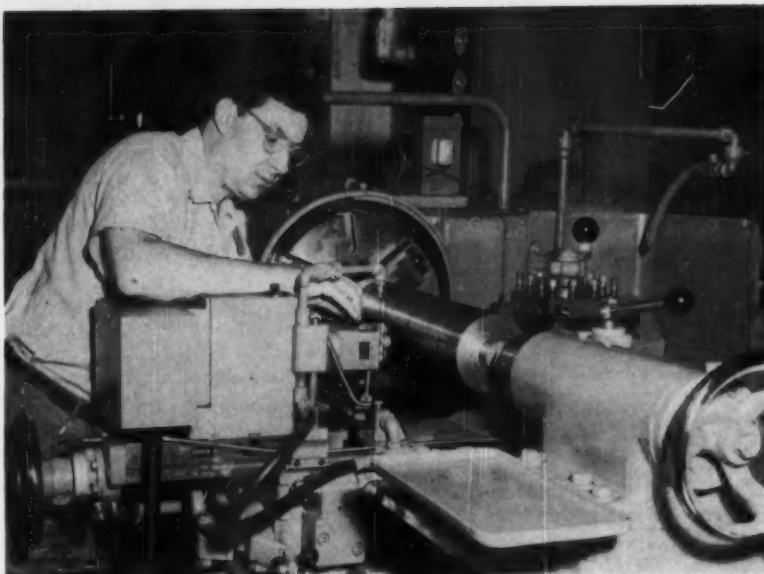
Watch Chip Breaker—Experience shows that chip breaker adjustment is most important; the chip must curl above the holder to break properly. Failure to adjust the chip breaker in this way will cause the chip to form a loose curl.

In turn, this will cause the machined material to contact the face of the tool or undermine its tip. When this happens, the end result is severe cracking, edge chipping, and premature tool failure.

Extensive tests on ceramic tool materials in the Arsenal's machining laboratory paved the way for their successful use in rough turning gun forgings.

Early Tests Failed—It wasn't an easy job. Early attempts to prove that ceramics would make acceptable cutting tools were disappointing. This was true even though cuts were tried on alloy steel test billets of less strength and hardness than the gun forgings.

For example, in trying to machine an alloy of 136,000 psi tensile strength and Brinell hardness of about 300, almost every early test of ceramic tools resulted in rapid



FINDING THE ANSWERS: Correct techniques for using ceramic tools on production jobs are worked out first on this machinability test lathe.

failure. Moreover, many of these failures actually occurred at lower machining speeds than are commonly used with carbide tools.

Modify Tool Geometry—But by using modified tool geometry and by directing cutting forces to the center of the tool shank (putting the tip in compression), the test pattern improved. Success with test billets of the 120-mm gun alloy soon led to the present procedure of rough turning production forgings.

To date, the laboratory has also successfully machined test billets of FS 4340 steel having a tensile strength of 217,000 psi and hardness above 460 Brinell. This was done at a cutting speed of 500 sfpm, a feed rate of 0.022 ipr, and a cut depth of 0.300 in. Total length of cut amounted to 600 in.

It should be noted that this 500-sfpm cutting speed could possibly be increased in actual production turning. However, the test lathe used in the Arsenal laboratory limited cutting velocity to the rate mentioned.

Gives Best Results—Laboratory personnel used various combinations of tool geometry on these

sintered oxide tools during the test program. The most successful results were achieved with a 15° lead angle, 7° negative side and back rake, a cutting edge honed to a 0.005-0.010 in. wide land on a 30° angle, and a nose radius of 0.062 in. The ceramic tools used on the gun turning job fit this specification.

Arsenal experience also shows that it is very important to place the cutting edge or nose radius of the ceramic tool on the centerline of the material being machined. In addition, when machining surface scale or out-of-round workpieces, the lead angle should be advanced to between 30° and 45°, and the speed reduced to eliminate possible chatter due to increased chip width.

The ceramic tip should not be allowed to dwell in the cut. If it does, there is a tendency for it to chip severely. Moreover, it work hardens the surface of the material being cut to the detriment of subsequent machining operations.

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Get Faster X-Ray Inspection With Mobile Carriage

By W. G. Hitt—Asst. Chief Inspector, Santa Monica Div., Douglas Aircraft Company, Inc., Santa Monica, Calif.

Mounted on a mobile carriage, large tank weldments are now inspected more efficiently and in far less time.

Here's an approach that could help to speed up your X-ray procedures.

■ By cutting exposure and processing time by one-third, an X-ray technique for nondestructive testing helped to speed the USAF's missile program. It also adds to reliability, simplicity of operation, and material savings. It was developed

at the Santa Monica Div., Douglas Aircraft Company, Inc.

A major problem facing the company's nondestructive testing group was to provide facilities for the X-ray inspection of large tank weldments. In addition to meeting normal requirements for reliability and on-time delivery of missile components, the idea was to keep costs down to a level commensurate with those of an average product development.

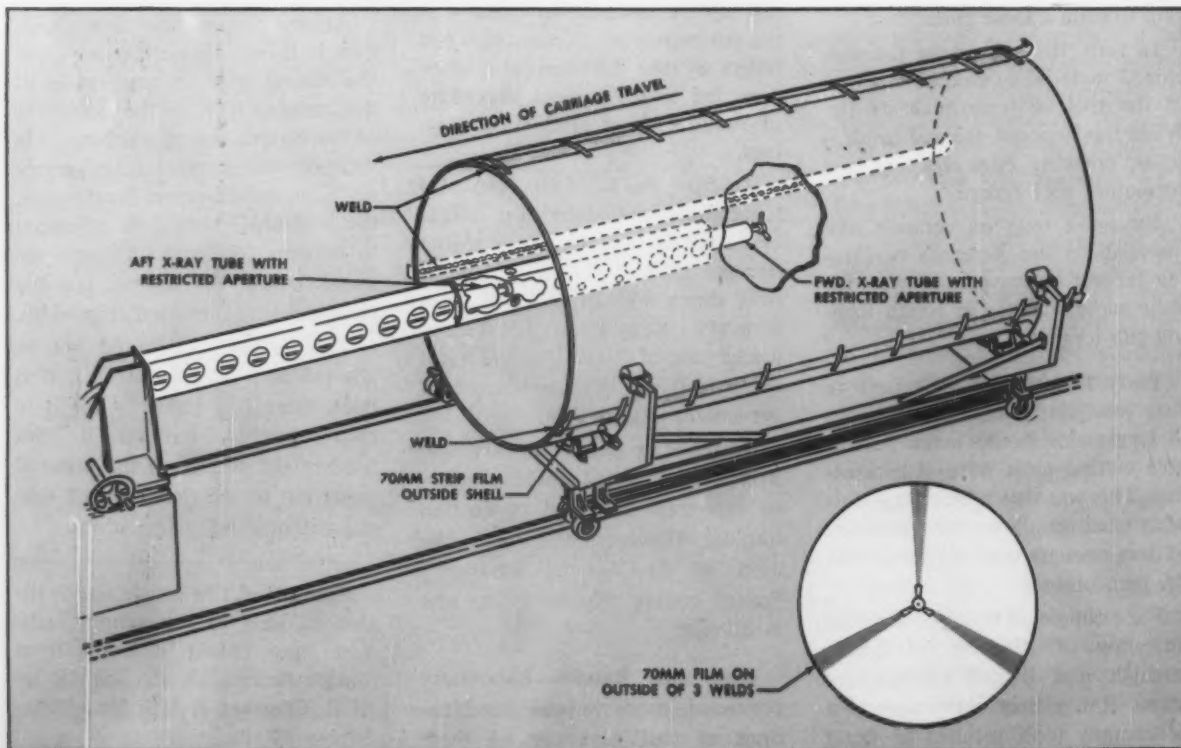
New Savings—To use conventional X-ray techniques and equip-

ment would have required the construction of additional X-ray rooms or buildings. These, in turn, would have to be equipped with both X-ray machines and film processing equipment.

Conventional X-ray technique called for exposing individual 3½ x 17-in. cassettes. Three cassettes would be placed in line over one weld bead and exposed for a period of 90 seconds. After exposure, the cassettes would be removed and three more applied in line.

This technique would be re-

Here's How Mobile Unit Works



peated along the longitudinal weldments of the tank. Since the tank is made from three longitudinal segments, the process would have to be repeated for each of the joining weldments. In addition to high costs, such a technique would not provide the speed necessary to meet schedules.

Rides Track—Basically, the alternative approach consists of placing two rod, anode-type X-ray tubes on a boom and porting the X-rays through three slits which project a narrow beam to the three weld areas of the tank. The welded tank is placed on a carriage that rides a track anchored to the floor of the building.

An electrical, variable - speed drive propels the carriage and tank along the track at a speed of 6 ipm. Simultaneously, the three lines of weldments are exposed to the X-ray beams.

X-ray units are located at the center and at one end of the boom. With this arrangement, it is necessary to propel the tank only half

its length to obtain complete exposure of all three welds.

Operating Pointers—An accompanying sketch shows the installation in use inside the X-ray room. The 70 mm film strip used on the weld beads is shown in this view. When an aluminum weld is being X-rayed, the film strip is held in place with adhesive tape at convenient intervals. With steel units, small magnets are used to do the same job. Personnel are protected from X-ray exposure by 12 in. of concrete.

After the longitudinal weld seams are X-rayed, any questionable areas are repaired and again checked by X-ray. Next, the tank ends are welded into place. To expose this circumferential weld to X-ray, the slit fixture is removed from the end of the anode tube. This permits 360° exposure of the weld. For this operation, 70 mm X-ray film is wrapped around the weld area.

Saves Film—No strip film packaged in light-proof material was available commercially. For this

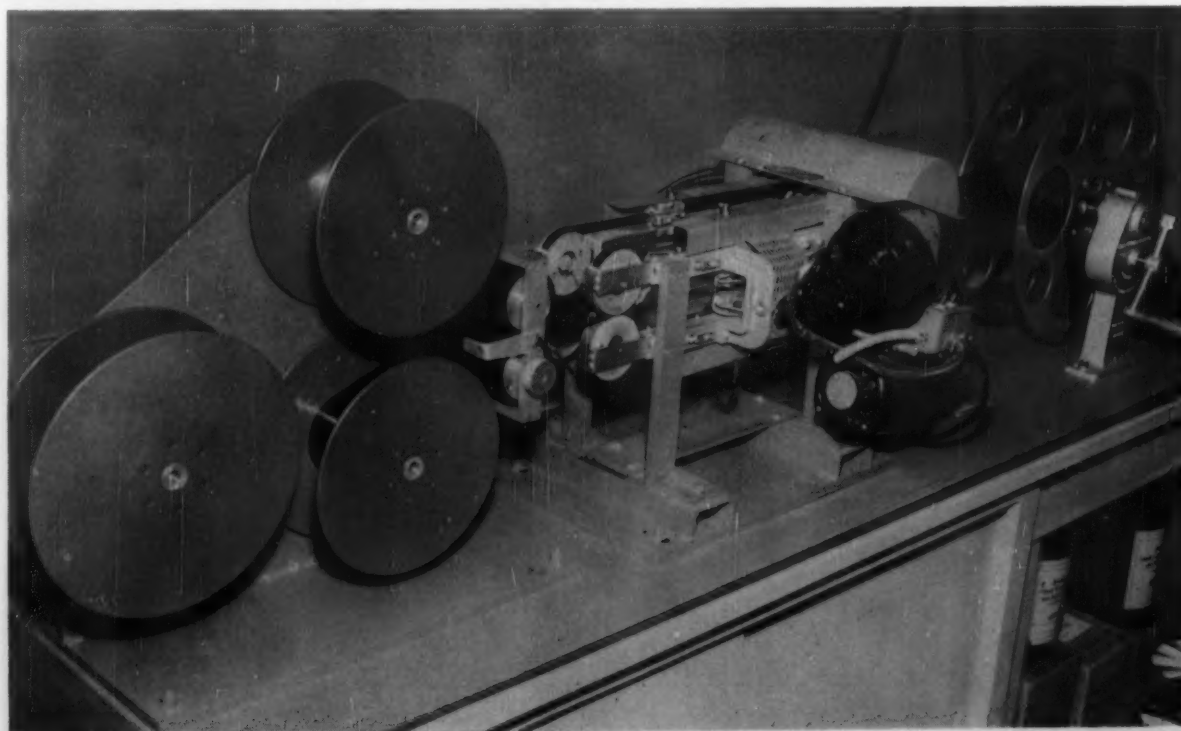
reason, Douglas developed a special packaging unit shown in an accompanying photo.

The spool at the far left contains the 70 mm film. The two spools immediately to the right are mounted vertically, one above the other. These contain a black polyethylene material. The film is placed between the two polyethylene strips and is wound to the right. It passes through two edge heat-sealers to the metal spool at far right.

Film waste results from the fact that commercial cassettes use film that is wider than necessary for inspection. Additional waste of film results from the overlap of the cassettes. In the overlap area, the image is inferior.

Other Advantages—Strip film tells a continuous story with no chance of misplaced sections.

Originally, it took 3 hours to completely examine the three longitudinal welds. The mobile X-ray technique handles the same job in 35 minutes. Processing time for the conventional method was cut from 3 hours to 1½.



SPECIAL PACKAGER: Film (at left) goes between spools containing black polyethelene, avoiding film waste.

How to Reduce Breakage Of Small Piercing Punches

By Federico Strasser—Consultant, Santiago, Chile

Small punches break easily. When they do, losses in time and production add up fast.

Some of the causes aren't so obvious. Here's how to find and eliminate them.

■ The most frequent casualties in metal stamping shops are, without doubt, the small, round punches used in progressive-type and compound dies. Causes of breakage are many and varied. For the most part, however, they fall in three main groups, related to tool design, tool construction, and use (or misuse) of the tool.

There are several standard forms for small punches. The simplest and least costly type has a straight (one-

diameter) form. The head is simply peened or taper-turned to a 60° included angle. Better tools of this type have wider, square-section heads, turned from stock of larger diameter.

When the ratio between hole diameter and length of the punch becomes too large (1:5 is a practical limit), the punch must be a two-diameter type, as in Fig. 1. This style has a thick body (at least twice the hole diameter) and a short cutting point. Length of the cutting tip is 2 to 2.5 times the hole diameter, and no more than twice the stock thickness.

Added Support — One way to avoid trouble with small diameter punches is to put straight punches

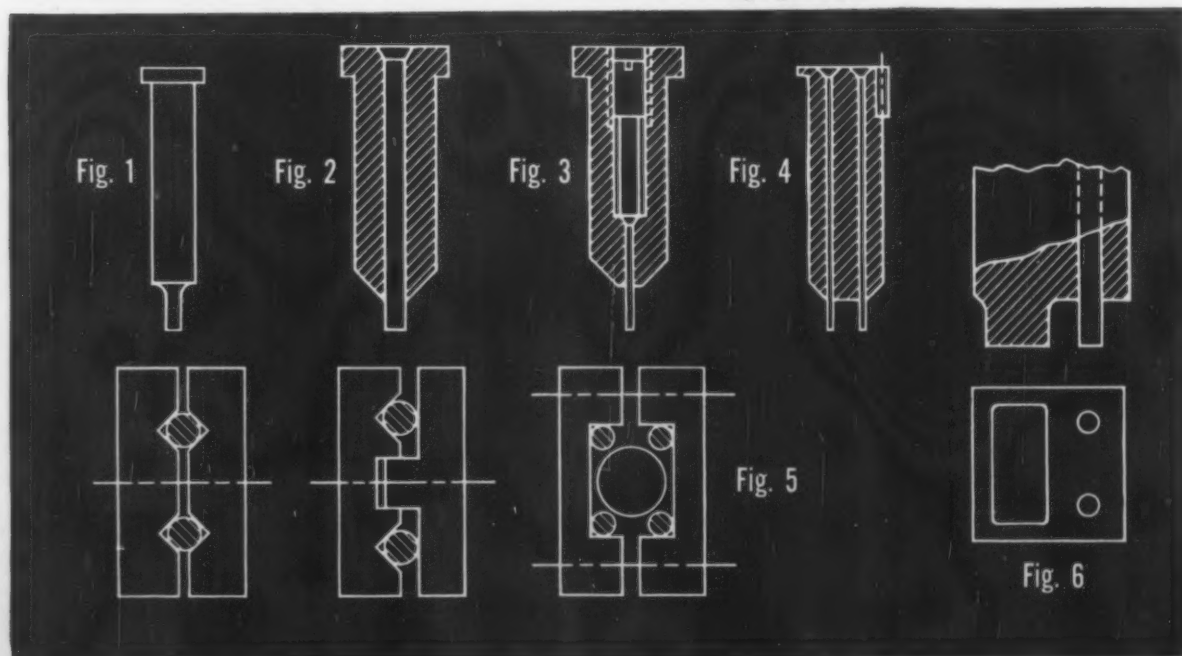
into reinforcing quills or tubes. Fig. 2 illustrates a simple form of this design, with the punch peened to form the head needed for stripping.

For smaller diameters it's necessary to reduce the length of the inserted punch bit. The upper part of the quill-hole is filled with a suitable filler-rod and set-screw as in Fig. 3.

Sometimes two small round punches are so near each other there is no room for two quills. In such cases one double quill carries both punches (Fig. 4). Of course, some means must be provided to keep the quill from turning around. It can be held in position by pins, set-screws, or the like.

Other solutions for holding two adjacent small punches consist of

Small Punches Need Extra Support



Varied Bottoms Prevent Slug Lifting

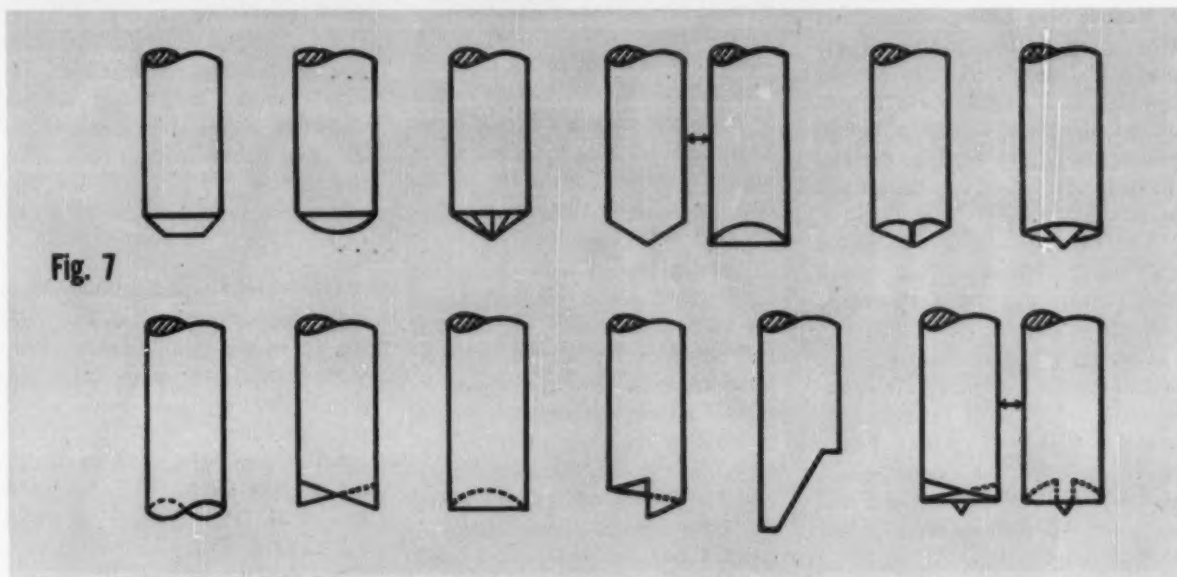


Fig. 7

sectioning the quills, making them like vice-jaws or fixture-jaws (Fig. 5). The two jaws are then held together with screws or bolts.

If a small, round punch is near a large one, it might even be incorporated into the body of the latter (Fig. 6).

Bottoms Can Vary—The punch bottom is usually flat, at right angles to the punch axis. However, there are many cases where giving the punch bottom (that is, the actual cutting surface) some other shape will reduce cutting pressure and lessen the danger of breakage.

This is true where hole diameter is small, stock gage is heavy, ultimate stock strength is high and the ratio between stock thickness and cutting periphery is high. Typical variations are shown in Fig. 7.

For highest strength, the punch should be as short as tool function allows. Keep in mind that the load which can be safely carried by a punch is inversely proportional to the square of its length. Where overall tool design might result in long punches, they can be shortened by using auxiliary spacer blocks.

There are several other reasons for making small piercing punches shorter than regular blanking punches.

First of all, in staggered or gang cutting, the press has to operate at the cutting pressure demanded by the large punch, not by the sum of all the punches.

In the second place, when stamping heavier stock, the metal spreads due to plastic flow. If a small piercing punch is near a large blanking punch, there's danger of breaking the slender cutting point of the former. Blanking punches with shear on their cutting edges produce the same effect.

Watch Die Openings—The sectional form of the cutting opening in the die plate is also an important factor. To reduce cutting pressure, such die openings should be fully tapered as in Fig. 8, without straight or parallel land. Angular clearance should be rather high, to facilitate the cutting action.

Finally, angular clearance must be perfectly uniform all around; if not, the punch will be thrown toward the side where cutting is easier. Both the punch and the die-plate are likely to meet an early end.

One of the most common causes of punch breakage is clogging of punchings, or slugs, in the piercing-die opening. A tapered die opening will prevent it. But since the cor-

rect tapered reamer isn't always at hand, alternate methods have to be used. A good way is to make the holes with two drills as in Fig. 9. The smaller drill makes the actual piercing opening while a slightly larger one forms the bottom, or clearance hole.

Keep Clearance Small—A common error is to make the clearance hole quite large on the theory that the slugs will fall through easier. Actually, because of sticky lubricants and burrs, they tend to hang together and pile up across a large hole.

Since the lateral expansion of the slug is only a couple of thousandths of an inch maximum, make the clearance hole only 0.01 in. larger than the piercing hole diameter. Then the slugs will fall right through. With punches having shapes other than flat across the bottom, slugs are somewhat deformed and have less or no tendency to stick in the die opening.

Walls of the piercing opening should of course be quite smooth. The tool must be correctly set so that the slugs have absolutely free discharge. All clearance holes in die plates, die-holders, and the like must be correctly sized and aligned.

Keen cutting edges—both on die

plates and punches—prevent burrs and thus reduce clinging.

Reduce Slug Lifting—Sometimes slugs cling to the bottom of the punch and are lifted from the die opening. If a slug happens to rest on the die plate so that it covers part of the cutting edges of the die, the next press stroke may deflect and break the punch.

The chief causes of slug lifting are heavy lubricant, too much punch clearance, and poorly made punches or dies.

Careless die making may result in bell-mouthed or flared die openings (Fig. 10). This increases the tendency of slugs to lift from the die plate. Bell-mouthed openings are also produced by abrasion and natural wear if cutting edges aren't kept sharp.

Other Causes and Cures — If punch sides, near the bottom, have toolmarks, file scratches and other

irregularities, the slug clings to them. And, like the die plate, the punch bottom may be deformed by natural wear and become mushroomed, which makes the slugs or blanks stick to the punch.

When the stock is too thin in relation to blank area, the blank won't expand enough after the cutting action to make it cling to the die-opening walls.

Another remedy is to change the shape of the punch bottom to break the vacuum created by the oil film and reduce adherence. In addition, scrap deformation caused by an irregular punch bottom helps greatly in keeping the slugs down. Types which have proved successful in actual practice include cross-grooving or other indentations, concave, pointed, rounded, shear-shaped and chamfered ends.

About Punch Clearance—Proper punch clearance is vital. This is the difference between diameters of the punch point and the die opening. The amount of punch clearance depends chiefly on stock quality, its physical properties, its thickness and the shape of the cutting opening. It must be neither too small nor too large.

Too much punch clearance increases cutting pressure. It'll produce too much burr around the pierced hole. And finally, the slug is more likely to be pulled out of the die opening, because it won't expand enough to cling to the inner walls.

The punch plate, which carries the piercing punches, must be quite strong to prevent its bending and throwing the punches out of alignment. The fit of the punch shank in the punch plate must be correct. Loose punches result in chipped cutting edges and breakage.

Use Back-up Plates—It's wise to put backing plates between heads of small punches and the top punch holder, as in Fig. 11. They take the cutting pressure thrust off the punch-heads. Back-up plates are always needed when cutting pressure exceeds 37,000 psi of punch cross-section. Also use them for

punching mild steel when punch diameter is less than three times the stock thickness.

Back-up plates are made of plain carbon steel and hardened. Grinding is needed only when notable distortion occurs in heat treatment. Their thickness should be about that of the metal to be cut, but never less than 0.10 in. or more than 0.30 in.

Guide and Support—Small piercing punches must have a close sliding fit in the stripper plate. Provide a stiff, rigid support for the punch. For very small holes, where punches have a thick body and small cutting point, add an auxiliary stripper. Make it of hardened tool steel. This acts as an extra guide, as in Fig. 12.

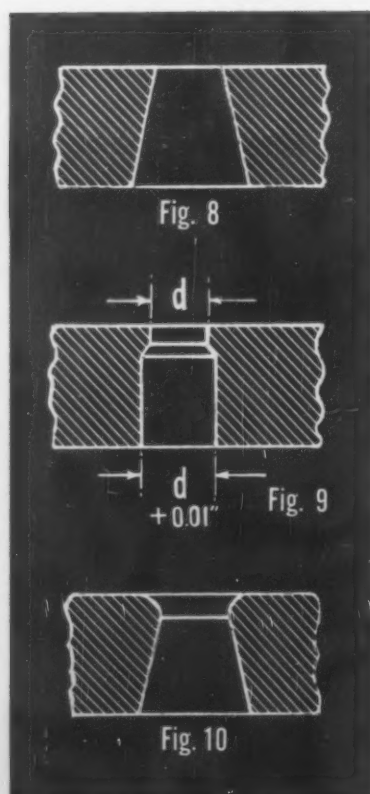
An even better system is to provide hardened bushings (sometimes standard jig bushings) in the stripper. Bushings must be high enough (if necessary, longer than the stripper-plate height) to prevent the punches from leaving them. This keeps out dust and grit, which might otherwise promote quick wear and enlarge the bushing hole.

Where there are no adjacent blanking or punching punches to give support, slender piercing punches are easily bent during tool setting, storage and handling, especially if the tools are not mounted in proper die sets. An easy way to provide support for such punches is to equip the tool with a couple of strong blind punches as in Fig. 13. These are shorter than the actual piercing punches. Use hardened drill rod and make a sliding fit in holes in the stripper-plate.

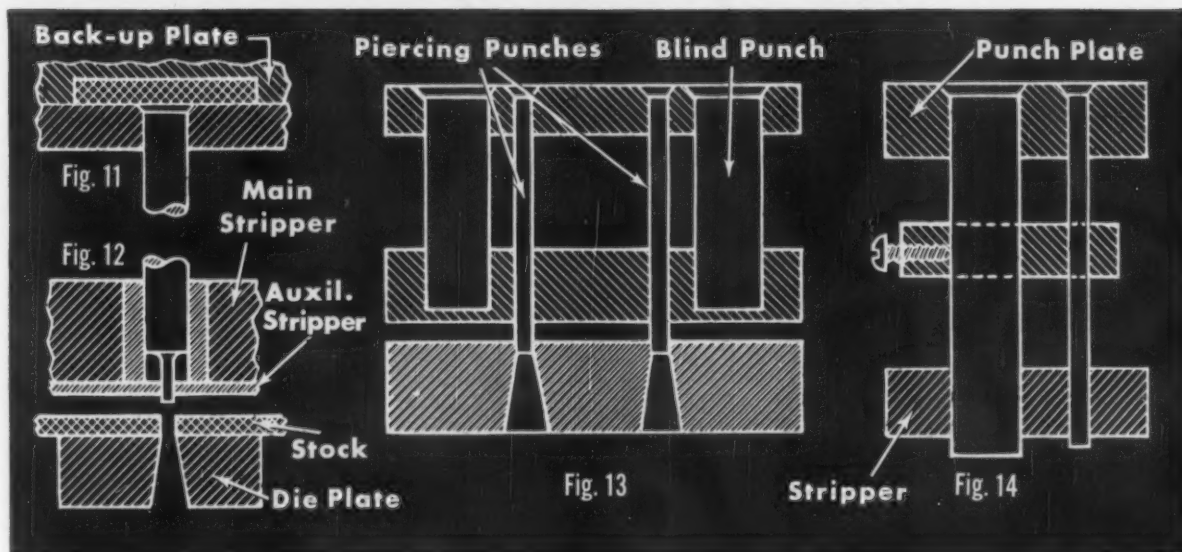
Tie to Heavy Member—In tools where some heavier punches are located near the small ones, the latter may be supported by means of accessories linking them to the larger members (Fig. 14). And at times, the small piercing punch can be incorporated into the body of a larger punch.

Stock guides which govern the transverse position of the strip or coil may provoke punch breakage if they're too high in relation to the

Die Openings Are Critical



Accessories Help Extend Punch Life



length of the internal canal of the tool. This is especially true with heavy stock.

In any cutting die, it's vital that cutting pressure be evenly distributed on all the cutting edges, so there's no side strain. If lateral thrusts aren't eliminated (or at least compensated) displacements occur between punch and die. The result will be nicked cutting edges, broken punches and die plate, or at the least, drastic decrease in tool life.

With stepped punches it's advisable to provide depth stops in the form of sturdy steel blocks put on the stripper or on the punch plate. This prevents too deep penetration of punches into the die openings.

Choose Quality Steel — Punches may be made from drill rod, plain carbon steel, high carbon steel, alloy steel or high speed steel, according to work requirements. Since only a small portion of overall cost of a punch goes for material, high-production tools should be made of tough, wear-resistant metal.

Machining and finishing of small punches has a decided influence upon their strength. A punch should be finished without any appreciable surface imperfections. Finishing marks should run lengthwise, in the direction of punch movement.

Tips on Heat Treatment — Punches must be properly hardened to increase their strength. This operation is of utmost importance. Heat treatment may bring out the maximum potential or decrease it to almost nil.

For maximum toughness and wear resistance, small piercing punches should be hardened to 60 to 63 Rc.

Regarding stepped punches any workpiece in the shape of a round bar with a large-diameter body and a small, short point presents problems for the heat treater. To avoid this difficulty, harden a round bar of the right body diameter without first turning down the small punching end. Then, after hardening, grind away that part which would normally have been turned while the steel was still soft.

Check Alignment — For best punch performance, the axis of the punch cutting point and the axis of the corresponding die opening should exactly coincide. In the case of two-diameter punches, the cutting point and the punch body must be absolutely concentric. The punch must be perpendicular to the punch-plate and the latter parallel to the die plate. And the die plate must

be perpendicular to the punch-axis.

The stripping action (separating the punches from the pierced hole) is often more important than the actual cutting action. Quite often, a punch is broken during stripping after having successfully performed the cutting operation.

The stripper plate must be quite strong so it won't bend or deform under stress. It calls for accurate machining to get the bottom surface even and smooth.

It must also be mounted correctly, perfectly parallel to the die plate top surface. If not, the slender cutting points of the punches are subjected to bending stress and are easily broken.

For small punches and light duty work, use movable strippers guided on the guide-pins of the die set.

The die set itself has a marked influence on punch life. A sturdy die set with amply dimensioned base and punch holder, guides and bushings insures perfect alignment between punches and die plates.

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Two New Superalloys Excel At Elevated Temperatures

By E. E. Reynolds and R. K. Pitler—Research Metallurgists, Allegheny Ludlum Steel Corp., Pittsburgh

Here are two new alloys with considerable versatility. Both can be readily forged and welded.

One alloy has the advantage of low alloy content along with good high-temperature properties.

■ Two high-temperature superalloys for aircraft gas turbine applications are gaining widespread interest in the missile, airframe, and commercial turbine fields. Both are precipitation hardening alloys and were developed by Allegheny Ludlum Steel Corp., Pittsburgh.

One alloy, named D-979, has an iron-nickel-chromium base. The other, named AF-71, is an iron-manganese-chromium base alloy. This latter material has a lean alloy content.

Both grades can be readily produced in billet, bar, wire, sheet, strip, and foil forms. AF-71 is melted by conventional air-arc

melting. The D-797 alloy is produced by consumable electrode, vacuum arc melting. Both materials have been turned out on a commercial basis in production-sized, 10-ton heats. Compositions and standard heat treatments of these alloys are given in Table 1.

Vacuum Melted—An austenitic alloy, D-979 is made precipitation hardenable by additions of titanium and aluminum. Its solid solution is strengthened with molybdenum and tungsten. Consumable electrode, vacuum remelted, this material is available in extremely large, high quality billets. Ingots up to 20-in. diam and weighing 5500 lb have already been successfully produced.

The tensile and stress-rupture properties of this alloy equal or surpass those of the nickel-base, high-temperature alloys that can be precipitation hardened. These unusual properties result from strengthening by a controlled age-hardening reaction which results

from a heat treating sequence.

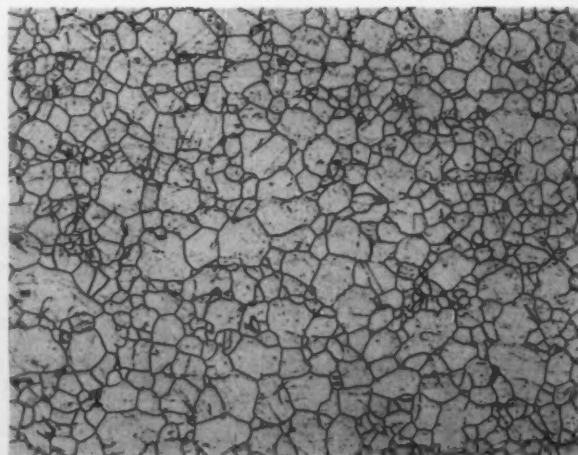
Lowest Hardness—This sequence begins with a solution treatment at from 1850° to 2050°F, followed by rapid cooling. Such a treatment dissolves both the age-hardening constituents and the solid solution strengthening elements. It also provides minimum hardness and puts the alloy in its best condition for formability.

A double aging treatment has been developed for D-979. It consists of holding for 6-8 hours at 1550° F followed by holding for 16 hours at 1300° F. At 1550° F, precipitation occurs primarily at grain boundaries in a way favorable to high ductility. At 1350° F, precipitation occurs mostly in the matrix and promotes high tensile and creep-rupture strength.

Billets up to 15 in. square, sonically sound and with a fully equi-axed forged structure, are converted from 20 in. round ingots. From such billets, large forgings for



TWO STRUCTURES: Both typical of D-979, structure (left) represents the condition after holding at



1850°F for 1 hour and oil quenching. Structure at right has been similarly treated and then aged. (100X)

TABLE 1: Composition and Heat Treatment of D-979 and AF-71

Composition, pct:												
	C	Mn	Si	Cr	Ni	Fe	Mo	W	Ti	Al	N	B
D-979	0.05	0.30	0.30	15.0	15.0	Bal.	4.0	4.0	3.0	1.0	—	0.01
AF-71	0.25	18.0	0.30	12.5	—	Bal.	3.0	—	—	—	0.20	0.20
Heat Treatment:												
D-979	(Optimum tensile and creep-rupture strength)						1850°F - 1 hr, oil; 1550°F - 8 hr, air; 1300°F - 16 hr, air.					
D-979	(Maximum creep-rupture strength)						2050°F - 1 hr, oil; 1550°F - 8 hr, air; 1300°F - 16 hr, air.					
AF-71							2050°F - 1 hr, water; 1325°F - 32 hr, air.					

disks and shafts in aircraft gas turbines are made.

Weld Method—The high strength properties of D-979 can be obtained in bar, forgings, and sheet. (Table 2). Sheet material is readily welded. Stress-rupture and tensile tests on welded sheet show joint efficiencies of 95 to 100 pct. Plate material up to 5/8 in. thick has been satisfactorily welded by the tungsten electrode, inert-gas shielded technique.

AF-71 is an austenitic age-hardening alloy stabilized with manganese, carbon, and nitrogen. It is strengthened with additions of molybdenum, vanadium, and boron. Its tensile and stress-rupture properties are outstanding in comparison to other more highly alloyed materials such as A-286 and S-816. Typical properties are listed in Table 3.

Good As Casting—This new alloy, developed under USAF contract, can be cold worked to tensile strengths above 200,000 psi. As an added feature, its cast properties are as good or better than those of the wrought material.

AF-71 maintains its strength well at temperatures up to 1500°F. Unlike other precipitation hardening materials, it does not show a sharp drop - off in high - temperature strength at temperatures above the over-aging temperature.

It has been cast in ingot sizes up to 23 in. square, weighing 6300 lb. These have been made into forgings from 15-in. round billets.

TABLE 2: Typical Mechanical Properties of D-979

Tensile Properties					
(Heat treatment: 1850°F - 1 hr, oil; 1550°F - 6 hr, air; 1300°F - 16 hr, air.)					
	0.02 pct Yield, psi	Ultimate, psi	Elong., pct	RA, pct	
Room Temperature					
Sheet	115,200-138,000	195,500	16.7	—	
Bar	122,200-141,900	200,200	16.7	33.9	
Forgings	114,000-134,000	195,000	14.4	16.7	
1300°F					
Sheet	90,400-113,000	126,000	9.6	—	
Bar	88,300-114,400	125,500	22.4	41.6	
Forgings	88,000-114,000	128,000	16.2	26.1	
Stress-Rupture Properties					
(Heat treatment: 2050°F - 1 hr, oil; 1550°F - 8 hr, air; 1300°F - 16 hr, air.)					
	Test Temp., °F	Stress, psi	Hours to Rupture	Elong., pct	RA, pct
Sheet	1200	90,000	106	4.5	—
	1200	90,000	125	9.0	9.0
	1200	90,000	168	4.4	9.4
Bar	1350	57,000	88	5.5	—
	1350	57,000	202	2.2	12.7
	1350	57,000	97	11.0	19.0
Forgings	1500	35,000	57	3.3	—
	1500	35,000	82	5.2	10.2
	1500	35,000	98	4.2	9.4

TABLE 3: Typical Mechanical Properties of AF-71

Tensile Properties				
(Heat treatment: 2050°F - 1 hr, water; 1325°F - 32 hr, air.)				
	0.02 pct Yield, psi	Ultimate, psi	Elong., pct	RA, pct
Room Temperature				
Sheet	83,500-106,000	148,000	18.0	—
Bar	83,600-109,000	159,000	24.0	37.0
Forgings	76,500-99,700	147,500	19.1	19.6

Stress-Rupture Properties					
(Heat treatment: 2050°F - 1 hr, water; 1325°F - 32 hr, air.)					
	Test Temp., °F	Stress, psi	Hours to Rupture	Elong., pct	RA, pct
Sheet	1200	70,000	98	2.8	—
Bar	1200	70,000	74	16.0	50.0
Forgings	1200	70,000	103	10.0	34.0
Sheet	1500	20,000	81	5.0	—
Bar	1500	20,000	234	19.0	53.0
Forgings	1500	20,000	209	15.8	42.0



ROUGH CUT: Lathe operator takes 0.060-in. cut at 36 rpm. Shape of casting reduces machining time.

Cast Rolls Get Long Service

Savings in machining time and extra long service life far outweigh the extra cost of casting tool steel forming rolls to shape.

■ Cast forming rolls to shape: There's less machining and longer roll life—that's the experience of Kelsey-Hayes Co., McKeesport, Pa.

With the rolls cast in contours roughly approaching those of the finished shape, there's a 25-pct reduction in machining time. In addition, there's no need to buy or pay freight charges on metal which has to be cut away.

The weldable rolls are made of special tool steel by Jessop Steel Co., Washington, Pa. Capable of being reground 6 to 10 times, the rolls have a service life up to six

times greater than previous hardened materials used.

At Kelsey-Hayes, the rolling machines form cold-rolled strip steel into rims for passenger cars. Three sets of the cast-to-shape rolls are used on each line to give the wheel rim its finished shape.

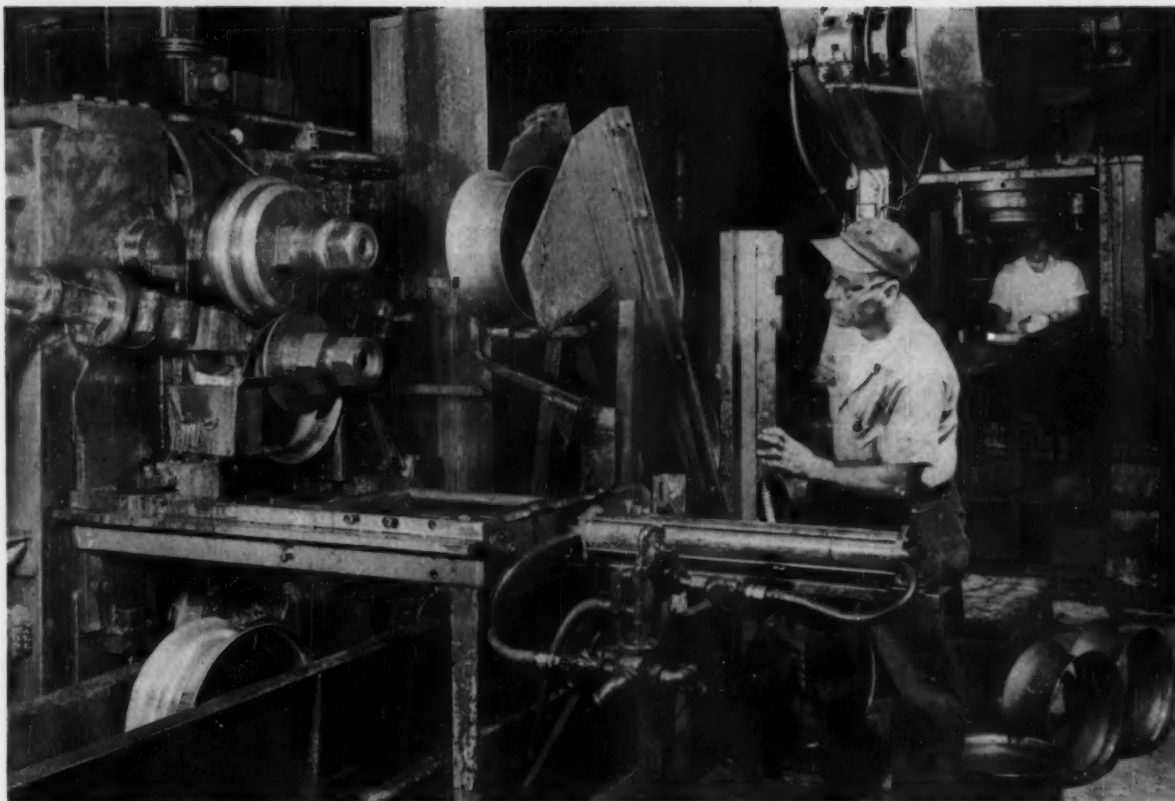
Tough Service—The wheels start as lengths of steel strips formed into circles, welded and dished slightly. The rims then pass through the three sets of rolls placed in tandem. A huge press at the end of the rim line gives the rims a final sizing.

Constant pounding and abrasion gives the rolls a rough workout. It's here that the quality of steel in the rolls minimizes the constant hazard of chipping.

S. H. Boyer, purchasing agent at the McKeesport plant, not only credits the cast rolls with taking multiple regrinds, but also reports the rolls can often be further machined for use as smaller rolls after a maximum number of regrinds.

Allow For Cuts—Kelsey-Hayes usually makes its own pattern for a new rim style. The surface to be machined is carefully marked on the patterns with an allowance of $\frac{1}{8}$ to $\frac{1}{4}$ in. for both roughing and finishing cuts.

The material for the rolls, an air-hardening tool steel, is a high carbon, high chromium steel with a high percentage of cobalt. Here is a typical analysis: C—1.55 pct, Cr—13 pct, Ni—0.40 pct, Mo—1.15



FORMING LINE: First pair of rolls has rim in process. Rim at left rolls towards next set of rolls.

pct, V—0.50 pct, Co—3.25 pct.

Also available is steel with low percentage of cobalt and nickel and a grade with a medium percentage of cobalt and molybdenum. Selection of any of the three tool steels depends on type of service.

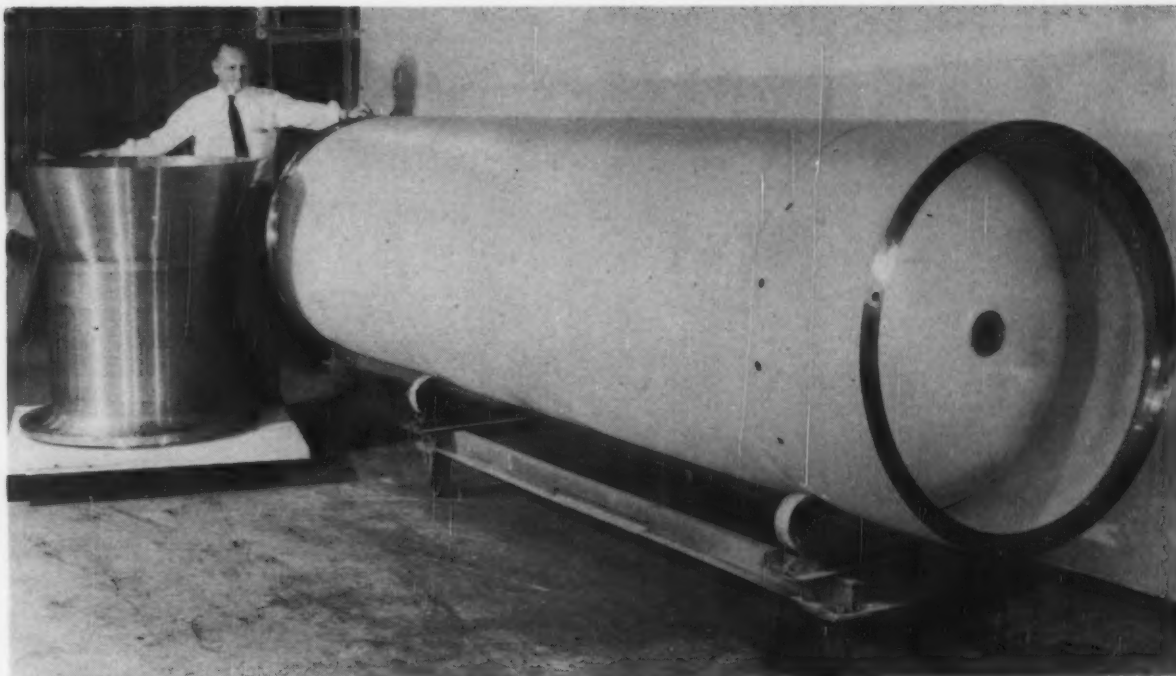
Annealing Steps—Annealing of the rolls refines the grain size. Formation of a uniform spheroidal structure facilitates machining and grinding. The rolls are heated slowly and uniformly to 1600°F. After thorough soaking, they are cooled to 1200°F at the rate of 10° per hour.

On reaching 1200°F, the furnaces are shut off. Castings are allowed to cool with the furnaces to 800°F. The resulting hardness is about 250 Bhn.

Hardening in an atmosphere-controlled furnace, or in packing, followed by cooling in still air or a dry air blast, gives the steel the hardness and quality required for long service life.



FINISH GRIND: Forming roll for shaping the top of a wheel gets final grinding. The cast-to-shape rolls can be reground from 6 to 10 times.



FINAL PRODUCT: Solid-fuel combustion chamber and nozzle are just two of the types and sizes needed today.

Making Missile Fuel Chambers Demands Top-Quality Work

By R. D. Libert—Mfg. Mgr., Aeronautical Div., A. O. Smith Corp., Milwaukee

Taking a look at missile work these days? It's a diverse and challenging field with rich rewards—and plenty of problems.

Fuel chambers typify the kind of forming, welding and heat treating you'll have to do.

■ Success in missile work requires being a specialist in some area of metalworking.

A. O. Smith, for example, has a backlog of experience in making high-strength aircraft parts. The firm has also made high-pressure vessels for many industries. Applying its welding and heat treating

skills to missile fuel chambers for both solid and liquid fuels seemed a logical next step.

These vital parts normally operate under extreme pressures. Often the chamber wall serves as part of the missile or rocket envelope. This means close dimensional tolerances and tight flatness specs.

Only aircraft-quality alloy steels will do. In some of the larger vessels, weld fabrication is just about the only practical way. It greatly simplifies turning out many smaller thin-wall tanks as well.

Standard Methods—On small lots and varied designs, sheet stock for the cylindrical body of the chamber is first brake-formed and rolled.

Then the seam is welded by either the tungsten inert gas (TIG) or submerged arc process, depending on gage thickness. Gage varies from about 0.050 to 0.250 in.

Generally, the two end or head assemblies are also welded to the body shells. In solid-fuel combustion chambers the aft head usually has a rather heavy flange that's welded into the truncated, elliptically formed head.

The flange ring is for attaching a closure assembly. This consists of a flange ring, dome section, and exhaust-nozzle bosses, all joined by fusion welding.

For Good Weldability—To date, most of the work at A. O. Smith

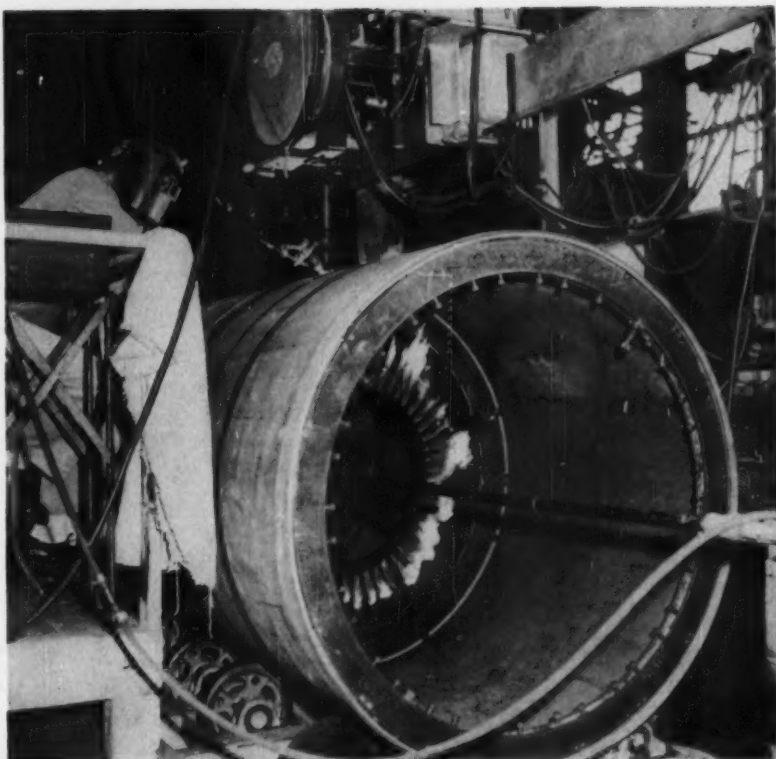
uses AMS 6434 steel. This is a modified SAE 4337 chrome-nickel-moly steel with 0.2 pct V added.

The prime advantage of this alloy is its weldability. Sheet and plate stock are readily welded with type 502 filler wire (4 to 6 pct Cr, 0.5 pct Mo).

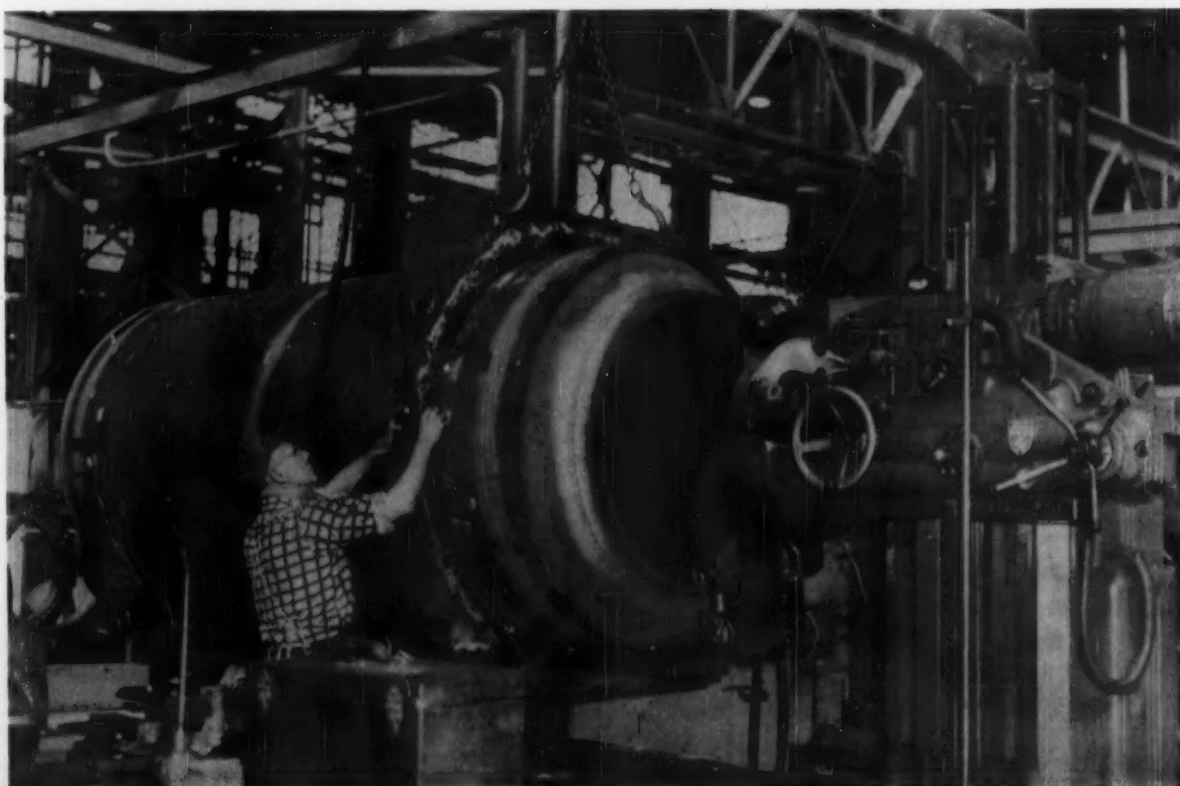
Strength has to be around 190,000 psi yield—and on a production basis. Some of the present work calls for alloys and weld filler wires to achieve 230,000 psi yield strength. This may soon reach 250,000 psi and beyond to reduce weight.

Watch Heat Treatment—Getting these strengths requires real care in heat treating. AMS 6434 being a martensitic steel with relatively high carbon, controlled atmosphere furnaces are used to prevent surface decarburization. Parts are normally quenched in a molten salt bath at about 400°F.

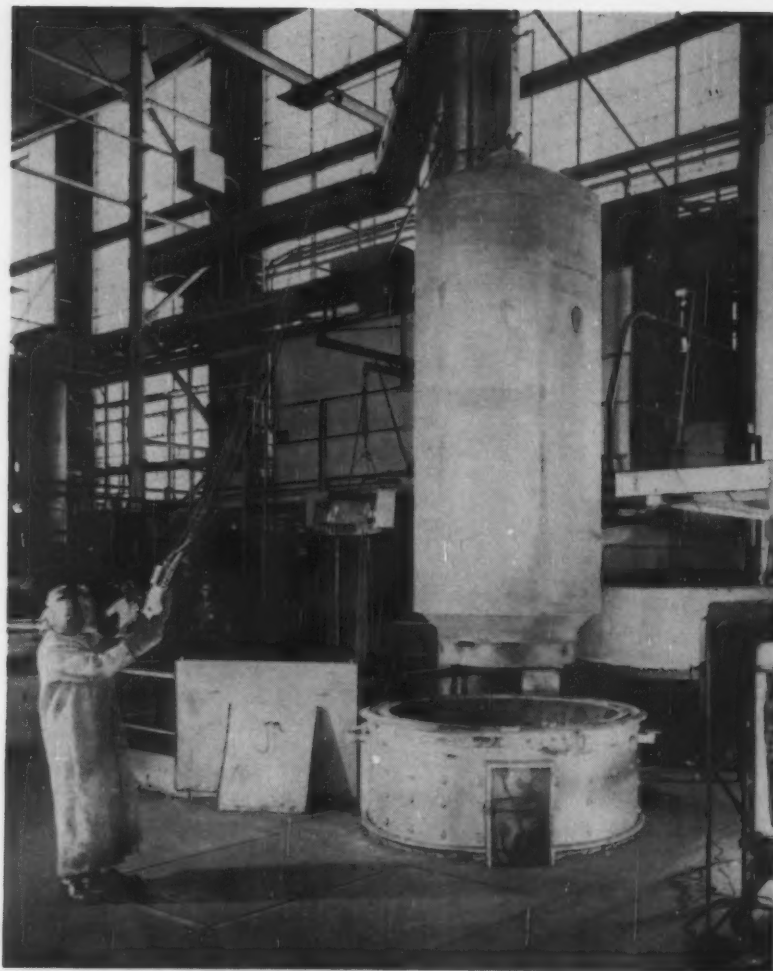
Some parts receive an oil or air quench, depending on special needs. The trick is to avoid distortion



GIRTH WELD: Automatic fixture rotates two shell sections being joined by tungsten inert gas process. Certified welder keeps tabs on work.



TOUGH CUT: Boring bar takes finish cut on bore of aft flange. Chamber has been heat treated to 48 Rc.



KING-SIZE WORK: Fuel cell comes out of heat treat furnace for quenching in salt bath at left rear. Vertical quench minimizes distortion.

while assuring minimum strength requirements in critical weld areas.

For any given tempering temperature with the weld processes and filler materials being used today, the base metal usually winds up with a slightly higher tensile strength—maybe two points in the 40-50 Rc range in which this work falls. However, the welds still have enough strength to meet minimum yield requirements.

Check Welds Carefully — Since welding is the critical operation, thorough inspection is vital. Every weld is given magnetic particle and penetrant inspection. In addition, all primary welds that will be pressurized in the proof load cycle or in actual flight are X-rayed.

All longitudinal welds and boss welds are radiographed with a 60° target port. The X-ray setup shoots a 360° picture on circumferential welds.

Completed chambers are hydrotested in cyclic fashion at pressure levels equal to service conditions. These tests subject the chamber to stresses approaching the material's yield strength. It's important, then, to hold close dimensional tolerances and avoid any stress concentrations.

Parts Need Sizing — Control of concentricity and mismatch are vital, especially in joining heads to body shells. Head shapes range from hemispheres to ellipses of various ratios. Forming methods include hydroforming, spinning, deep drawing with punch and ring, and punch-

and-die forming, including drop-hammer and explosive forming.

Most of these methods present problems in control of diameter, concentricity, contour and wall-thickness propagation. Sizing is required, usually by cold expansion, explosive sizing, or hot fixture stress relief.

Most chamber designs permit fairly normal diameter variations for the cylinder proper. However, TIR (total indicator runout), especially at chamber ends where heads and mountings skirts attach, and flatness tolerances are very critical. They override the basic diameter differences permitted.

Diameter may be allowed to vary as much as 0.250 in. But concentricity, bow and flatness limits can be as tight as 0.060 in. on diameters above 50 in.

Calls For Good Fixtures—Further contour variations can result from quenching and tempering. Accurate fixing is required to minimize these changes.

Tooling, especially for welding, must be very accurate and highly refined. Fixtures are mechanized, and actual welding is automatic. Setup of parts in the fixture is manual. Since longer chambers are formed by girth-welding two or more cylinders, alignment is very important.

Welding is monitored by a certified welder, who adjusts conditions as required. Automatic welding gives greater accuracy and uniformity than a manual process. The work can be mechanized even more for greater production.

All the way through, methods and materials are those which have been proved out in earlier work on aircraft. Refinements are made as required to meet the demands of missile and rocket designers.

However, development work is being done on new materials and techniques as they come along. While the wealth of processing experience with existing materials makes them the surest bet, no one can afford to overlook new possibilities.

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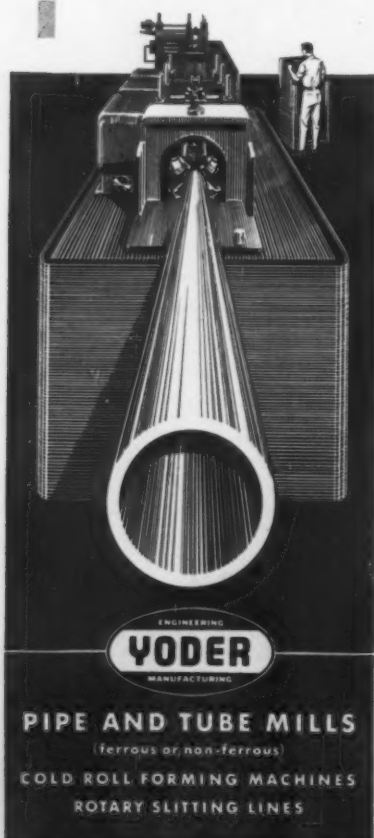
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FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 83.

Recorder Controller

A data sheet describes a multiple-point recorder-controller assembly. The unit gives two-position control on many processes involving multi-zone control. It measures 6 through 24 thermocouple points. (Leeds & Northrup Co.)

For free copy circle No. 1 on postcard, p. 83

Enclosed Switches

Industrial enclosed switches covered in a 20-page catalog are metal-enclosed. It lists nine housing groups. Switches include: explosion-proof, maintained-contact, pre-wired, hand-operated and sealed types. (Micro Switch Div., Minneapolis-Honeywell Regulator Co.)

For free copy circle No. 2 on postcard, p. 83

Plastic Laminate

For electronic uses, a paper-base epoxy laminate is described in a bulletin. In sheet or strip, the laminate has very low cold flow, high flexural and impact strength. (Synthane Corp.)

For free copy circle No. 3 on postcard, p. 83

Diesel Controls

Diesel engine controls featured in a 24-page bulletin include: heat and pressure controls, safety devices,

tachometers, valves, switches, relays, etc. (Minneapolis - Honeywell Regulator Co.)

For free copy circle No. 4 on postcard, p. 83

Battery Chargers

Dependable foolproof charging of lead-acid batteries is promised for a new charger in a 4-page bulletin. Unit gives a full charge every time. (The Lincoln Electric Co.)

For free copy circle No. 5 on postcard, p. 83

Turret Lathes

Ram-type automatic turret lathes are covered in an 8-page booklet. The custom-installed lathes have Lynn hydraulic drives. Operation is completely automatic. (Jones & Lamson Machine Co.)

For free copy circle No. 6 on postcard, p. 83

Alloy Powder

For use in high-stressed parts, a new alloy powder can be processed with existing equipment. A bulletin gives properties, heat-treat recommendations. (Republic Steel Corp.)

For free copy circle No. 7 on postcard, p. 83

Industrial Trackwork

For industries maintaining in-plant trackage, a booklet lists specifications for turnouts, frogs, guard rails, switch stands and crossings. (American Brake Shoe Co.)

For free copy circle No. 8 on postcard, p. 83

Copper Alloy Rod

Available in rod form only is a copper alloy with high thermal and electrical properties. A bulletin rec-

ommends the rod for items needing extensive or precise machining, and for many headed, formed, rolled, pressed or swaged parts. (Scovill Mfg. Co.)

For free copy circle No. 9 on postcard, p. 83

Corrugated Boxes

Basic rules for stacking and loading corrugated boxes are discussed in a 16-page booklet. (Hinde & Dauch).

For free copy circle No. 10 on postcard, p. 83

Iron Foundry

Uses of 31 ferroalloys and four briquetted alloys for both cupola and electric furnace foundry irons are covered in a pamphlet. Six are magnesium-containing alloys for producing ductile cast irons. (Vanadium Corp. of America).

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Lightweight Nut

Locknuts permitting 72 pct weight savings are subjects of a bulletin. Cold-forged for strength and compactness, the featherweight nuts have more than 125,000-psi tensile strength. (Standard Pressed Steel Co.)

For free copy circle No. 12 on postcard, p. 83

Epoxy Stripper

For stripping epoxy resins, acrylics, vinyls, polyesters and other hard-to-remove finishes, a new stripper is introduced in a 4-page folder. (Oakite Products, Inc.)

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Thermocouple Gage

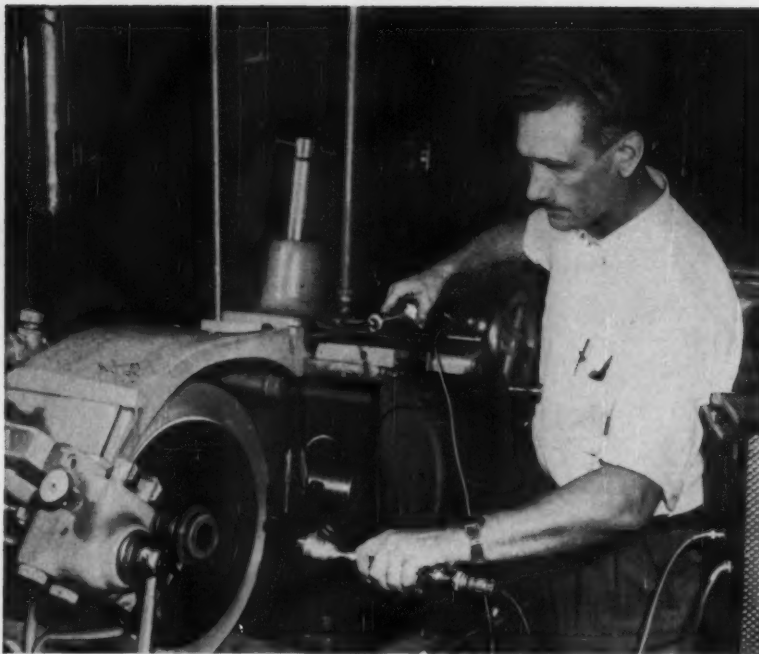
A vacuum thermocouple gage and a two-station thermocouple gage control are described in a data sheet. (NRC Equipment Corp.)

For free copy circle No. 14 on postcard, p. 83

Gear Drive

A 4-page bulletin deals with new motorized gear drives. These drives are gear reducers powered by standard NEMA frame motors mounted on a shelf attached to the reducer. (Louis Allis Co.)

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IRD VIBRATION ANALYSIS SYSTEM spots even .00001" displacement vibrations fast. Balances diamond grinding wheels like this

in 1/12 the time formerly needed. Saved enough time on this job alone to pay for itself in 6 months.

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WHY THE IRD SYSTEM GUARANTEES THESE RESULTS. Curiously, vibration is not the useless, random thing commonly believed. On the contrary, it is the easiest-to-use, yet most accurate guidepost to perfect balance. IRD Model 600 Vibration Analyzer employs this previously little used fact... simplifies dynamic balancing by making it a visual operation. Thus, even semi-skilled maintenance personnel achieve perfect results because they actually see the degree and direction of imbalance. Now you, too, can make dynamic balancing part of your routine maintenance program.

OTHER USES. IRD vibration analysis equipment makes it just as easy to accurately locate the exact source of vibration troubles. It eliminates hit and miss trouble shooting. It will pay you to read how others in your industry use IRD analyzers to step up production equipment output, make impressive savings in downtime. Write for literature.

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Slide Feed

A new bulletin illustrates a re-designed slide feed. New models are simple to set up and adjust. (U. S. Tool Co., Inc.)

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O₂ Analyzer

Minimizing scale on metal and assuring worker safety with an oxygen analyzer is described in a data sheet. It describes an inert gas blanketing operating during metal fabricating. (Beckman/Scientific and Process Instruments Div.)

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Cleaning, Finishing

Machines, systems and processes for cleaning and finishing metal products are featured in a data sheet. (Cincinnati Cleaning & Finishing Machy. Co.)

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Storage Rack

Low cost storage racks for warehousing almost any material are covered in a folder. Racks are easy to erect or dismantle. (Palmer-Shile Co.)

For free copy circle No. 19 on postcard

Plating Machine

Single-row plating and processing machines are outlined in a 4-page bulletin. (The Meaker Co.)

For free copy circle No. 20 on postcard

Self-lock Screws

A 28-page catalog describes self-locking socket screws. Included is a set screw selector chart listing over

1001 combinations of metals, locking actions, points and suggested applications. (Set Screw & Mfg. Co.)

For free copy circle No. 21 on postcard

Pipe Strainers

New self-cleaning semi-steel pipeline strainers are introduced in a bulletin. Sizes run from 1/4 in. through 3 in. They rate for saturated steam or liquids to 250 psi and 475°F. (Sarco Co., Inc.)

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Motor Control

Automatic reduced voltage starters are detailed in a bulletin. Included is motor control engineered for centrifugal compressors, hammer mills, pumps, large conveyors, large fans, motor-generator sets, etc. (Allis-Chalmers Mfg. Co.)

For free copy circle No. 23 on postcard

Solvent Safety

Safety of solvents for cold cleaning metal parts is discussed in a report. It covers a new safety index concept for solvent evaluation. It's based on maximum allowable concentration, vapor pressure and evaporation rate. (Electrochemicals Dept., Du Pont Co.)

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Coal Handling

How a fork truck scoop attachment solves coal storage problems for a manufacturer with limited storage facilities is told in a 2-page report. It shows how capacity jumped from 90 to 600 tons. (Clark Equipment Co.)

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Wire Stitching

Wire stitching is the subject of a 28-page book. Some 30 stitching machines are outlined. (Acme Steel Co.)

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Self-clinch Nuts

All metal, self-locking, self-clinching nuts are covered in a bul-

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FREE LITERATURE

letin. It explains how the nuts are used in thin sheet. They provide load-bearing threads in sheets of aluminum, magnesium, brass, copper, and cold-rolled steel. (Penn Engineering & Mfg. Co.)

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Stainless Tube

High temperature properties of Croloy 16-13-3 (TP 316) are listed on a data card. Also listed: chemical composition, size ranges and short time tensile and rupture properties. (Tubular Products Div., Babcock & Wilcox Co.)

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Oxygen Analyzer

Presented in a bulletin is an improved continuous oxygen analyzer. It uses a new automatic calibrator. This checks and corrects for deviations caused by variations in electrical output of the detector cell over long periods of operation. (Mine Safety Appliances Co.)

For free copy circle No. 29 on postcard

Sprayed Coatings

Wire and powder sprayed coatings of metals and ceramics are discussed in a bulletin. Also covered: various types of spraying equipment, including production-line automatic controls. (Metallizing Engineering Co., Inc.)

For free copy circle No. 30 on postcard

Air Filters

An engineering sheet outlines 40-micro breather filters. These permit free flow of clean air into hydraulic fluid, fuel and oil reservoirs. (Bendix Aviation Corp.)

For free copy circle No. 31 on postcard

Steel Shelving

Boltless steel shelving is the subject of a new eight-page booklet. A channel clip design gives advantages of fast installation, easy rearrangement and high strength and rigidity. Also covered are drawer case units, service counters, tool

storage racks and shelving boxes. (Penco Div., Alan Wood Steel Co.)

For free copy circle No. 32 on postcard

Cartridge Filters

Depth-type fiber cartridge filters for full flow filtration of all types of fluids are presented in a new catalog. A chart aids in selection. Weight and installation data is given for all model series. (The Cuno Engineering Corp.)

For free copy circle No. 33 on postcard

Crane Control

Just published is a new bulletin describing the components, enclosures and applications for an alternating-current crane control. The control is designed for light industrial cab- or floor-operated cranes. (The Electric Controller & Mfg. Co.)

For free copy circle No. 34 on postcard

Vacuum Degassing

A producer of tool steels, stainless steels and high-temperature metals, is giving customers the benefits of vacuum degassing degassed die-casting die steel as a standard process. A bulletin explains the company's use of vacuum melting techniques. (Universal-Cyclops Steel Corp.)

For free copy circle No. 35 on postcard

Free-Machining Bars

A company's high-strength free-machining steel bars have physical properties compared to those obtained by heat treating without need for heat treatment. Machinability is 50-100 pct faster than for equivalently hardened alloy steels. A new four-page bulletin reviews these benefits. (La Salle Steel Co.)

For free copy circle No. 36 on postcard

Horizontal Presses

In capacities ranging from 25 to 600 tons, a company's line of horizontal presses is described in a catalog. Models have both single- and double-action rams and fixed or movable head and table channels. (Dake Corp.)

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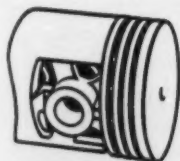


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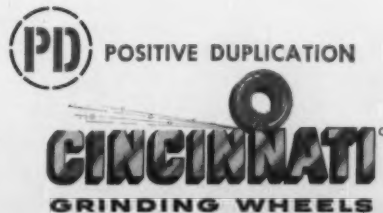
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New Materials and Components



Foam Insulation Cuts Appliance Space, Material

Refrigerator makers may increase usable interior space 50 pct without enlarging the exterior, thanks to a new foaming insulation. Using foam polyester resins and blowing agents (i.e., Freon, Genitron, Isotron), the insulation has low "K" factor, rapid cure. It foams in place. A major asset is this: automated equipment can apply the insulation. Other advantages: savings in bulk storage facilities; permits use of lighter gage panels; eliminates back panels; it's

self-sealing. Even considering other foams, it's low in cost. In addition to appliances, it may find applications in insulated building panels, trucks and trailers, cold storage chambers, etc. Sound-dampening properties also may qualify it for still more diversified jobs. The insulation's developer says 1¼-in. thickness of the rigid foam equals some 3 in. of conventional material. (Pittsburgh Plate Glass Co.)

For more data circle No. 38 on postcard, p. 83



Aluminum Sheet Has Sparkling Bright Finish

Fabricators of items that can benefit from an unusual, glittering finish may now obtain a new sparkling aluminum sheet in commercial quantities. Finished products gleam and sparkle with contrasting patches of light and dark gray. Anodized gold and other colors are available. It comes in mill finish, spangle etch finish, and spangle etch color finishes. The mill finish is for fabricators who want to apply the spangle acid etch in their own shops. Alu-

minum Co. of America, which has just released the material, points out that it "offers vast possibilities as automotive trim, refrigerator and appliance trim, lighting fixtures, jewelry and novelty items, and interior decorations." Sheet thicknesses run from 0.032 to 0.100 in. Maximum width: 36 in. Maximum length: 96 in. Other sizes and gages and coil are subject to inquiry (Croname, Inc.)

For more data circle No. 39 on postcard, p. 83

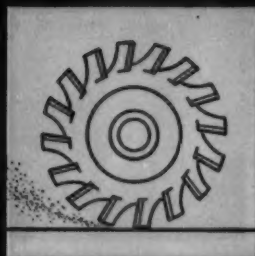
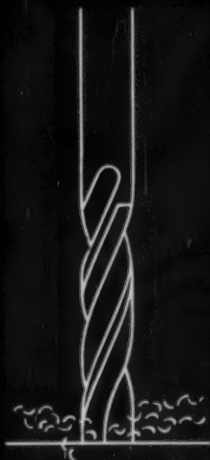


Lead Vinyl Shields Against Nuclear Radiation

Though designed mainly for protection of personnel conducting X-ray inspection tests, etc., a new type lead vinyl may have many other uses in metalworking. Considerably lighter in weight than conventional lead rubber shielding, it has a smooth, non-absorbing surface. The lead vinyl material offers thorough radiation protection in any lead equivalent. Standard thicknesses have 0.25 mm, 0.50 mm and 1.00

mm lead equivalent. The shielding material has successfully withstood 100,000 to 1,000,000 roentgen units with no physical change. Various environmental tests under extremes of freezing and heating result in no appreciable changes. The material comes in the form of personnel shields or for special applications, including curtains for dividing rooms. (Bar-Ray Products, Inc.)

For more data circle No. 40 on postcard, p. 83



vega

air-hardening tool and die steel is the

easiest to machine of all air-hardening tool steels. Vega was specially developed by Carpenter to combine toughness and the machining properties of an oil-hardening steel with the safety in hardening of an air-hardening grade. It is safe to harden and even intricate dies with many cutouts, sharp corners and thin sections come through heat treatment with outstanding freedom from distortion and size change. Call your local Carpenter Service-Center for immediate delivery from complete stocks.

the *Carpenter* Steel Company, Reading, Pa.

A message to a leading

PROJECT ENGINEER

Would you consider a change—new climate, locale, living conditions—unique challenge, permanency and more than commensurate rewards?

Kaiser Engineers is seeking a man of unusual skill and experience. He must have at least 10 years of progressive integrated steel plant development experience. He must know plant layout, construction design, and be of managerial caliber. He will be charged with the continued development of new steel plants and the expansion of existing plants in the U.S. and abroad. His salary will be more than generous.

This man and his family will enjoy indoor-outdoor living in the mild, smog-free San Francisco Bay Area. Here are fine new schools and famous Universities, the culture and sophistication of San Francisco, plus year around recreational opportunities ranging from sea to Sierra and including all sports.

This man will enjoy, too, life insurance, free family health plan, retirement, moving allowance and other perquisites.

Can you qualify? Are you interested? If so, why not write today in strictest confidence to:

ADDRESS BOX G-818
Care The Iron Age, Chestnut & 56th Sts., Phila. 39

DESIGN DIGEST

Sealing Material

Of caulking consistency, a new sealer remains permanently elastic, has excellent adhesion to most materials including metal. It retains this characteristic after extensive aging within a temperature range of 160° to -40°F. (Armstrong Cork Co.)

For more data circle No. 41 on postcard, p. 83

Cold-heading Wire

Special type wire is now available to manufacturers of recessed-head screws. Cold forging recessed-head screws places extraordinary demand on raw steel wire; considerable pressure is exerted on the head when indenting the recessed



cross into the metal. The special wire eliminates splitting. The wire provides freedom from harmful surface defects. It withstands maximum deformation in cold heading. (Jones & Laughlin Steel Corp.)

For more data circle No. 42 on postcard, p. 83

Solid Lubricant

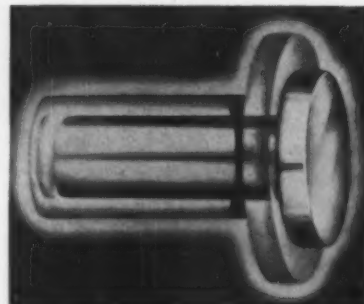
A solid film lubricant increases wear life of moving parts operating in oil or grease. It contains small particles of lead, tin and graphite. Semi-porous nature of the material absorbs oil and acts as a reservoir against metal to metal contact under high loads. It's especially good during long shutdown periods. Compatible with additives in modern oils and greases, its first use was on

titanium under loads so heavy that oil or grease alone was inadequate as a lubricant. (Electrofilm, Inc.)

For more data circle No. 43 on postcard, p. 83

Insulated Rivets

Plastic insulated, low cost, metal rivets come in many sizes. The fasteners consist of metal rivets (aluminum, brass, steel) where shank

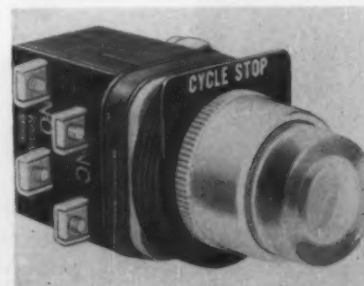


and under-the-head surfaces are covered with uniformly thick nylon. Rivets have uses where it's necessary to fasten two or more metal parts and yet not have parts connect electrically. Other applications include riveting to ceramic or glass where the nylon acts as a shock absorber to prevent cracking. (Pylon Co., Inc.)

For more data circle No. 44 on postcard, p. 83

Lighted Pushbutton

Combining a pushbutton with a pilot light is this oiltight unit. Completely sealed, its contact block has double break, silver alloy contacts that require no maintenance. Flexible circuitry permits the pilot lamp to be wired to go ON or OFF on pressing the button. Or it can be energized from a separate source.



In addition, it can be wired as a push-to-test pilot light. A step-down transformer in each unit supplies the rugged 6-v pilot lamps. (Allen-Bradley Co.)

For more data circle No. 45 on postcard, p. 83

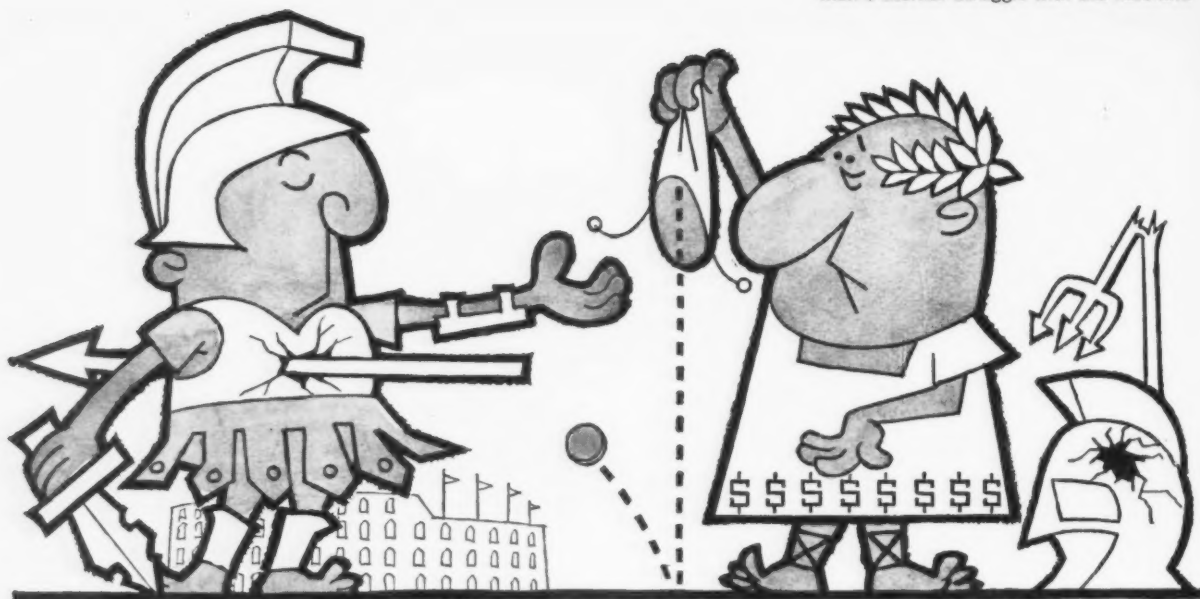


**There is no substitute for stainless steel
in automobiles**

No other material is as bright, strong and resistant to rust and wear as Stainless Steel. It gives every car the clean, exciting beauty that sells in the showroom and re-sells on the used car lot. Look for *Stainless Steel* on your new automobile.

Specify McLouth high quality sheet and strip Stainless Steel. McLouth Steel Corporation, Detroit 17, Michigan.

Mc LOUTH STAINLESS STEEL



WITH ALL THE COSTS OF DOING BUSINESS RISING STEADILY, PROFIT IS MORE ELUSIVE THAN EVER!

How long can the cost of "getting new equipment to work right" be buried in overhead?

No matter how attractive the original price of the equipment, it's false economy if the price tag *did not* itemize the extra money required to get it into production!

To your great responsibility for improving manufacturing processes has been added an *extra* concern for that old standby, catch-all type goodfellow called "overhead".

Overhead can no longer afford the labor and hard, cold cash-money often needed to make new equipment operate properly.

Sciaky knows about "overhead", too. That's why Sciaky resistance welding and production equipment is built to satisfy the requirements of *your* particular application. That's why Sciaky equipment is thoroughly tested and proved to do that particular job *before shipment*.

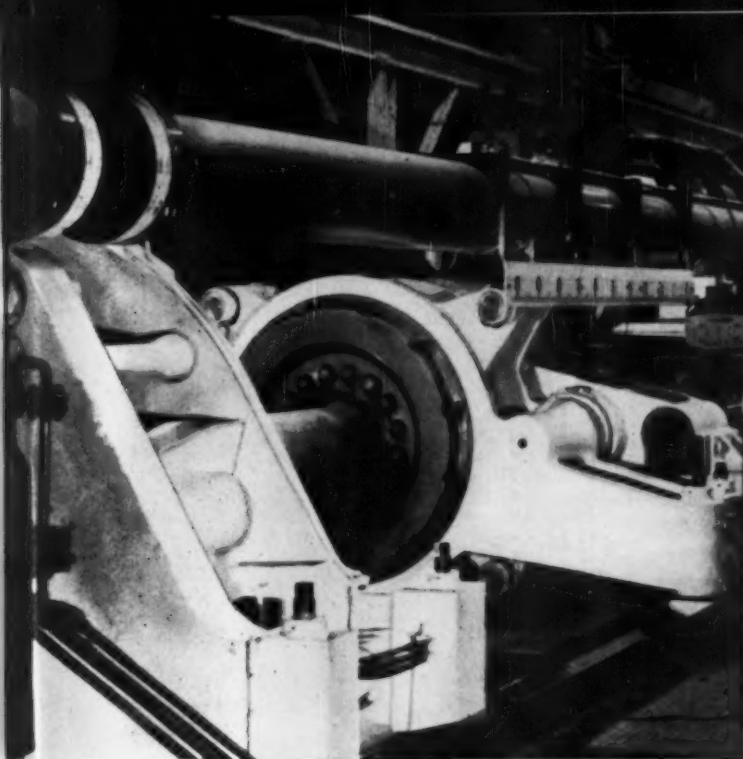
The result protects the profit your manufacturing operations can earn by (1) providing only the right equipment at the right price, (2) minimizing the lost time and cost of production try-out, and (3) minimizing rejects and costly re-working.

Why take less than the full advantage of consulting with a Sciaky Application Engineer the next time you are considering equipment. No obligation, of course.

A successful manufacturer of double-bowl kitchen sinks took that advantage. As a result, they replaced the previous high-reject, unprofitable method of fabrication with Sciaky resistance welding equipment. Within only ten days of installation, over 10,000 sink units were produced with less than a 1% scrap factor. Write for "Resistance Welding At Work", Volume 4-No. 6 for the details.

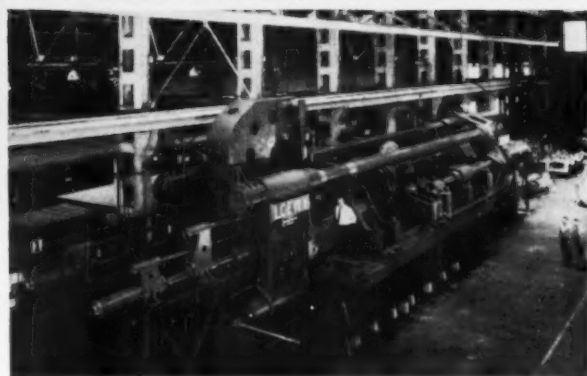


SCIACY BROS., INC., 4923 W. 67th STREET, CHICAGO 38, ILLINOIS • PORTSMOUTH 7-5600



Designed and built by Loewy-Hydropress, this 6000-ton hydraulic extrusion press for light metals and steel is seen in operation at Reynolds Metals' Phoenix, Ariz., plant.

90-ft.-long extrusion press on erection floor.



New and highly automated extrusion press is 10th by Loewy in Reynolds' nationwide organization

Flexibility, power, speed, precision... these are the characteristics of a highly automated 6000-ton-capacity extrusion press designed and built by Loewy-Hydropress for the U.S. Navy and operated by the Reynolds Metals Company, America's second largest producer of aluminum.

This new press is designed for maximum concentricity and for easy change from low to high speed without change of valves. One important feature is that it permits changing over quickly from working aluminum to working steel and titanium.

On this Loewy press, substitution of containers, which in conventional extrusion presses requires many hours, can be done in 30 minutes or less. A further feature is a mandrel mover that can be stopped independently of the press movement, and that holds the mandrel stationary in relation to the die. This makes it possible to extrude shapes of unusual design, such as

small, hollow configurations which can only be made with specially shaped mandrel tips. A unique device provides for the handling of split dies for step extrusion.

Other features of this advanced Loewy press are these:

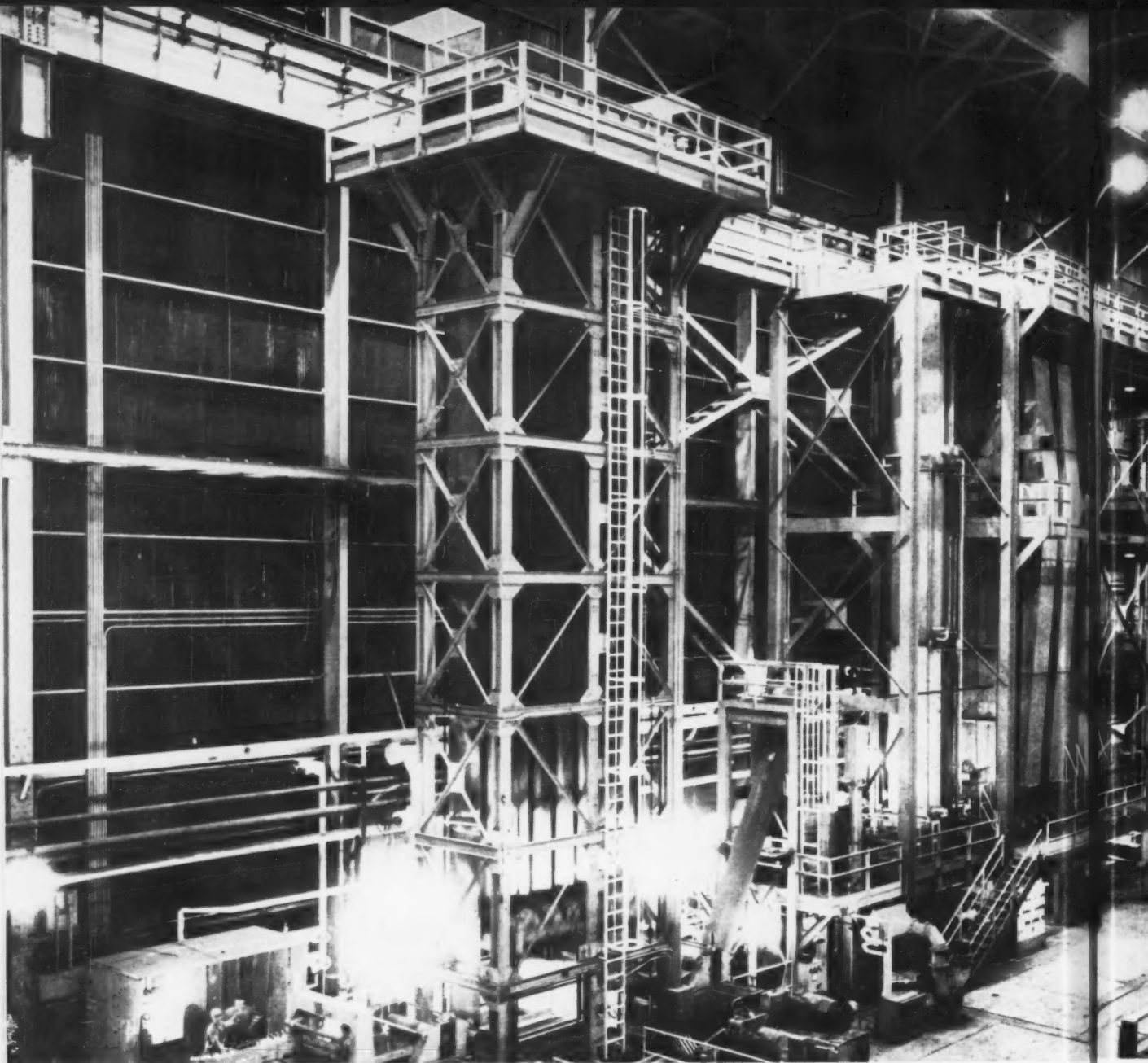
- Automated constant speed control
- Automated billet loading system
- Semi-automatic butt and dummy block handling device
- Application of rectangular containers for extremely wide and thin extrusions
- Extrusion of billets up to 50 in. long and 20 in. in diameter into shapes more than 100 ft. long and 16 in. in diameter

Striking evidence of customer satisfaction with Loewy presses is the fact that this machine is the tenth designed and built by Loewy-Hydropress for Reynolds. The same engineering skills that produced it will go to work in your service no matter how large or small the equipment you need. Simply write us at Dept. A-1.

Loewy-Hydropress Division
BALDWIN · LIMA · HAMILTON

111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering



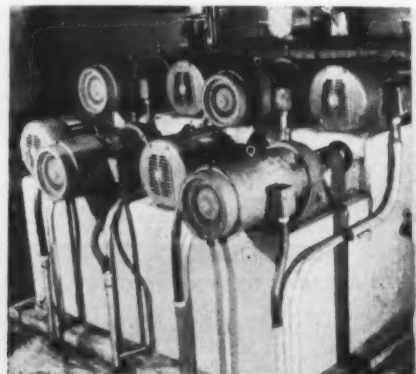


SPACE-SAVING General Electric continuous annealing line helps reduce annealing time, improves strip quality.

ACCURATE SYSTEM CONTROL is provided by this centralized, space-saving General Electric DC adjustable voltage control panel lineup.

ABUNDANT POWER for operating furnace rolls is supplied by these G-E motor-generator sets (left). Panels (right) control all 440 volt AC power distribution.

POWER-PACKED lineup of new General Electric gear-motors used on cleaning and preparation section of annealing line are rated $7\frac{1}{2}$ hp, 184 rpm.



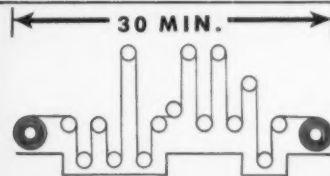
OLD

BATCH
ANNEALING



NEW

GENERAL ELECTRIC
CONTINUOUS PROCESS
ANNEALING



CLEANING, HEATING, COOLING
AND WINDING DONE IN ONE
CONTINUOUS OPERATION.

GENERAL ELECTRIC HELPS
YOUNGSTOWN SHEET & TUBE

Reduce Annealing Time from 5 days to 30 minutes

A new G-E continuous process annealing line recently installed at Youngstown Sheet and Tube's Indiana Harbor tin mill, East Chicago, Ind., has demonstrated its economy and efficiency in only a few weeks of "on-the-line" operation.

According to Youngstown engineers, "The line not only increases productive capacity, but does it in about a third less space, and a lot faster—too." Generally, the line has improved operation efficiency by as much as 100 per cent, and cut annealing time from 5 days to 30 minutes over one of the batch annealing installations previously used.

Here's how G-E continuous annealing benefited Youngstown:

1. **Greater uniformity with continuous anneal**—every part of coil is exposed to the same annealing conditions.
2. **Higher temperatures uniformly and easily obtained**—permit considerable savings because equivalent strength and stiffness can be obtained with thinner gage steel.
3. **Superior resistance to corrosion of the base metal is obtained**—results in some lengthening of the average shelf life of canned products.
4. **Time is saved**—continuous process reduces material handling.
5. **Space saving**—floor space is reduced by at least a third.

In addition, G-E continuous process annealing lines contain the latest developments from G-E product and research laboratories. Such product progress, as indicated by newly applied G-E D-C Kinematic* gear-motors on Youngstown's annealing line, is immediately passed on to improve complete systems.

Get complete information on how electrical systems for continuous annealing line can benefit your operation from your nearest G-E Apparatus Sales Office. Ask for bulletin GEA-6017A, Electrical Systems for Continuous Metal Processing. General Electric Co., Section 659-124, Schenectady, N. Y.

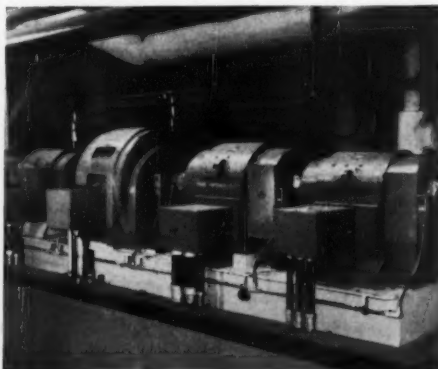
* Reg. trade-mark of General Electric Co.

Engineered Electrical Systems for the Steel Mill Industry

GENERAL ELECTRIC



MASTER MOTOR-GENERATOR set with General Electric motor rated at 700 hp, 1200 rpm, 2300 volts, drives four G-E annealing line generators.



New Production Ideas

Equipment, Methods and Services



Attachment Lets Small Lathes Cut Most Radii

Equipped with this attachment, some 75 pct of all normal radius cutting can be done on small lathes. So states the attachment's manufacturer. At high speeds, it removes soft or very hard metals with equal efficiency. Ball ends have been formed of materials of Rc66. Three size tools are available currently; 3-in. models fit small (9 to 12-in.) lathes. These can be blocked to fit larger lathes. Larger lathes also can use 4 or 8-in. models. Other sizes

are under development. Key feature of the cutter is its radii setting which is solely by a standard depth micrometer. This eliminates guesswork and makes the tool a precision instrument. Working range of each model is extensive. The 3-in. one cuts from 0 to 3 in. convex, from 0 to 3 in. concave radius depth in sockets, and up to 8 in. in sockets on parts larger than 3 in. (Holdridge Mfg. Co.)

For more data circle No. 50 on postcard, p. 83

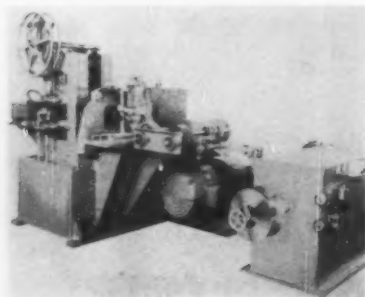


Power Rollers' Brake Prevents Overcoasting

Power rollers in a new series feature a cam-actuated idler roll and a magnetic brake; the latter prevents overcoasting. Each of six models in the series boasts the magnetic brake. This provides a positive stop; it lets the operator work to a scribed or hair line without need to compensate for the rolls coasting. Direction of the rolls can be switched backward, forward or stopped at any time by tripping a

foot control. Accurate circles of any diameter larger than 2 in. can be formed in sheet material in just two passes through the rolls due to the cam-actuated idler roll. Bends can be located at any point in sheet material with straight sections on one or both sides. Power roller models come with 12, 18, 30, 36 or 42-in. forming widths. All forming rolls are ground and polished. (O'Neil-Irwin Mfg. Co.)

For more data circle No. 51 on postcard, p. 83



Versatile Wire Line Occupies Little Space

Compactness is the key feature of this versatile 5-in-1 wire line. Occupying little floor space, it draws, flattens, edges, sizes, shapes, electronically gages, and accurately coils the finished product in traverse wound bundles. With up to 3/4-in. entry diam capacity, it offers production speeds to 600 fpm. Exit

flat is gaged for thickness with a Pratt & Whitney electro-light gage. The entire line operates from a single, infinitely variable-speed, alternating current motor with a simple electric drive. Take-up reel is hydraulic. (Fenn Mfg. Co.)

For more data circle No. 52 on postcard, p. 83

STEEL POLISHING SPEEDED 10-15% WITH "PG" WHEELS



POLISHING

MANUFACTURER: Heintz Division of Kelsey-Hayes Co.

ADDRESS: Philadelphia, Pennsylvania.

PRODUCT MANUFACTURED: Automotive Metal Stampings.

3M ABRASIVE USED: "PG" Wheels.

HOW 3M ABRASIVES ARE USED: Finishing operation. Remove die marks, scratches, and other forming defects from cold-rolled carbon steel auto grille bars, prior to plating.

OPERATIONAL DATA ON 3M METHOD: Grit 220 Resin Bond Cloth "PG" Wheel on double-spindle floor lathe with buff-wheel.

OPERATIONAL DATA ON PREVIOUS METHOD: 2-station, 3-step method. 1st, #120 disc; 2nd, set-up wheel; 3rd, buff-wheel.

PROVEN ADVANTAGES OF 3M METHOD: Former 3-step operation reduced to 2 steps; "PG" Wheel and Buff. "PG" Wheel leaves no scratches on work piece; speeds production 10-15%.

OTHER 3M ABRASIVE PRODUCTS IN USE: "Three-M-ite" Resin Bond Cloth Portable "PG" Wheels on hand-grinders are used to remove in-use scratches, other imperfections from dies, without removing them from press. "PG" Wheels replaced hand methods, reduced repair time from 14 hours to 30 minutes.

WANT MORE INFORMATION? Send for free manual, "Modern Metal Finishing with 3M 'PG' Wheels." Write to 3M Co., St. Paul 6, Minn., Dept. DD-19.

"PG" Wheels are manufactured in U.S.A. by 3M Company, St. Paul 6, Minn. Export: 99 Park Avenue, New York. Canada: London, Ontario

3M Coated Abrasives "PG" WHEELS

MINNESOTA MINING AND MANUFACTURING COMPANY

...WHERE RESEARCH IS THE KEY TO TOMORROW



NEW EQUIPMENT

Engineering Aid

In 30 seconds, a compact new unit automatically enlarges a 35-mm microfilm frame to a positive, dry, 18 x 24-in. copy of an original engineering drawing. Enlargements can be made on plain white paper, vellum, or offset paper masters. Regardless of medium, the enlargement

is of superior quality and emerges dry, ready for immediate use. (Haloid Xerox, Inc.)

For more data circle No. 53 on postcard, p. 83

Immersion Heating

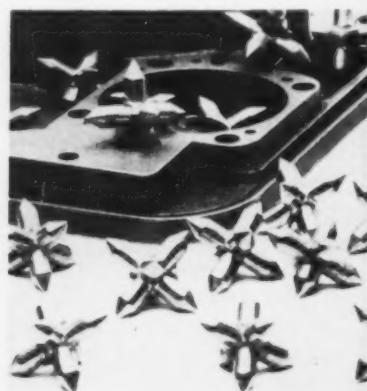
A new immersion electric heating unit has a cast insert which can easily be removed from the outer shell assembly. This makes possible changing of the insert without tank draining. This unit can perform heat

transfer in oils, water, caustics, and alkali cleaning solutions, and vapor degreasing compounds. (Thermel, Inc.)

For more data circle No. 54 on postcard, p. 83

Tumbling Media

For all type finishing barrels, new star-shape tumbling media precision finish intricate castings. The star shape is especially designed to



finish castings with odd holes or recesses. Over-all maximum dimension of each star's point to point is 1 1/4 in. Diameter of each point body measures 1/4 in. Stars are shipped in 100-lb containers. (BMT Mfg. Co.)

For more data circle No. 55 on postcard, p. 83

New Invention Picks Up 40 Cu. Yd. Detachable Containers . . . 15-Ton Loads



Dinosaur picks up in excess of 30,000 pounds of granular material, white line inside container indicates load has not shifted.

DEMPSTER-DINOSAUR Handles Containerized Cargo, Waste and Raw Materials . . .

The newly developed DEMPSTER-DINOSAUR is a system of materials handling that employs giant containers up to 40 cubic yards and larger. It lends itself to any situation where bulk accumulations of raw materials, liquids, waste or finished products must be

handled. Since one truck and one driver can automatically pick up, haul and dump or set down a number of containers, the DINOSAUR easily does the work of several trucks.

Two models are available — one for tandem trucks, handles 30,000 pounds; the other, for single axle trucks, handles 22,000 pounds. Special off-the-road models are available for loads limited only by the capacity of the truck.

Free Booklet Offered

A free booklet which describes the operation of this new system in detail is offered by the manufacturer.

Mfd. By

Patents Pending

DEMPSTER BROTHERS, Inc.

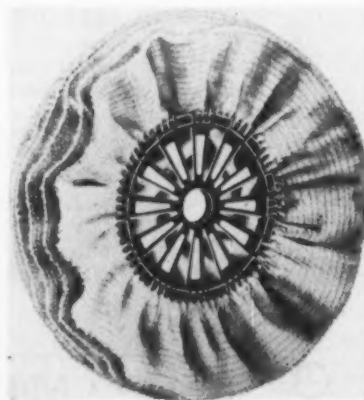
Dept. IA-1, Knoxville 17, Tenn.



Container is shown locked into carrying position.

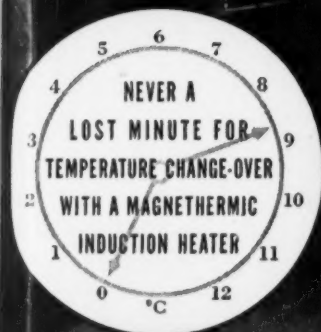
Fireproof Buffs

A new safety treatment fireproofs a company's entire line of cotton and sisal buffs for metal finishing. The treatment positively retards



flame. Buffs do not ignite even when directly exposed to fire. (American Buff Co.)

For more data circle No. 56 on postcard, p. 83



"This installation is Wolverine Tube, Division of Calumet & Hecla, Inc., Detroit, Michigan"

Three Magnethermics, 60 cycle, heating 8" x 15" copper and brass billets for a 3000-ton extrusion press. Each heater is individual of the other, operating from a common loading and unloading conveyor. One, two, or three heaters can be used, depending upon production requirements.

Flexibility for emergency orders - you never have to plan ahead for a temperature change-over...

SET THE DIAL — PRESS THE BUTTON — HEATED BILLET

You never have to backlog billets with a Magnethermic Induction Heater. Operator dials the temperature, presses the button, and a uniformly heated billet will be ready in moments. And the next billet and the next will be the same temperature. The Magnethermic heater also records the temperature of each billet so that you have a permanent record for checkback.

When a rush or emergency order upsets the day's schedule, the operator sets the dial to the new temperature and the Magnethermic is ready to deliver immediately. No costly shutdowns normally associated with fuel firing.

More than temperature can be changed over without production delay on a Magnethermic . . . size

of billet or type of alloy, as well as temperature, can be adapted in minutes.

This flexibility more than offsets the higher original costs, as many users of Magnethermics have confirmed. Once you have an induction heater, you can forget about the billet heating for your forging presses, extrusion presses or rolling mills. No more stockpiling. No more backlogging. No more long shutdowns.

Any metal that can be heated can be heated by a Magnethermic Induction Heater . . . low, dual or high frequency. There are Magnethermics in operation for aluminum, beryllium, copper, columbium, magnesium, molybdenum, nickel and nickel alloys, platinum, carbon and alloy steels, titanium, and vanadium.

Your Inquiry...

Any information on costs or procedure will be promptly sent in response to your request.

MAGNETHERMIC®
C O R P O R A T I O N
 3990 SIMON RD. • YOUNGSTOWN 7, OHIO



Herringbone's two pairs of Lang lay strands and one pair of regular lay strands provide the ideal combination of maximum flexibility with good stability.

Finer wires inside contribute to Herringbone's excellent drum-winding characteristic.

Heavier outside wires in each strand have greater resistance to abrasion.

**"... we
would
never
hesitate
to recommend it"**

GRAY & FEAR, CONTRACTORS

This company continues: "We have been using your Roebling Herringbone* for about one year. We find it is one of the best ropes we have ever used, outlasting previous ropes three to one. It is good that such a reliable rope is available."

This is a direct field quote on the most remarkable development in wire rope in years... a new concept in wire rope design. Roebling Herringbone is the regular lay and Lang lay wire rope—two-ropes-in-one rope—combining the best features of both.

Herringbone delivers extra flexibil-

ity, extra abrasion resistance, unusual structural stability, extra resistance to shock, easy operation over sheaves and drums and smooth spooling properties.

We recommend Herringbone without reservation for general hoisting and the entire range of heavy-duty equipment. Your Roebling Distributor or Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, will give the full and fabulous details. *Reg. App. For

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation



The Iron Age Summary

Big Steel Buildup Gathers Steam

Some mills report orders are coming in faster than shipments. Backlogs are mounting.

At least two big auto firms are building steel and parts to weather a three-month strike.

■ The big buildup in steel buying is gathering steam. Orders to some mills are pouring in at a rate faster than the mills are shipping.

Thus, order backlogs are mounting. The mills are beginning to fear they will have heavy carryovers of undelivered orders by the time June—and a possible steel strike deadline—rolls around.

Reverse English—In some products "the market is building up backwards. Buyers of oil country goods, for instance, have, in several cases, ordered more tonnage for May delivery than they have for February or March. In this way they figure to protect themselves against a strike without the cost of carrying heavy inventories during

the months immediately ahead.

The situation has reached the point where several tube mills have indicated they will not book casing orders for June delivery. This is interpreted by steel buyers to mean that the mills figure they'll have a carryover problem by the end of May and want to use June to clean up these orders.

Strength Is Broadening—One peculiar thing about the present market is that Chicago, St. Louis, Cleveland, and the area surrounding Chicago are gaining substantially in steel demand each week. The buildup in Pittsburgh and the East has been slower and more gradual. But now there are signs that plate and sheet demand, particularly, will soon be spilling over from the Midwest into Pittsburgh and the East.

The biggest improvement in orders is coming from the automakers. Two of the Big Three auto companies have firmed up plans to stock up with enough steel and

parts by June to weather a two-to-three-month steel strike.

What Buyers Think—A check of purchasing agents in the Chicago area indicates they are counting on a strike of as much as six weeks' duration. At the same time, some steel users are dragging their feet, apparently in the belief that if they need steel in a hurry they can always get it.

The pickup in demand appears now to be affecting just about all steel products. Sheet and coated sheet products—galvanized and terne plate—are the strongest. Plates are coming on strong. And so are oil country tubing and linepipe. Bar products—both hot- and cold-rolled—are gathering strength.

Structurals Lag—Structural demand is still lagging. Structural fabricators—the companies that put together sections for buildings and bridges—have stepped up their buying a little. But several structural mills are still combing the bushes for business.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,151	2,123	1,849	1,496
Ingot Index				
(1947-1949=100)	133.9	132.2	115.1	93.1
Operating Rates				
Chicago	85.0	83.0*	84.0	57.0
Pittsburgh	71.5	72.0	60.5	57.5
Philadelphia	76.0	77.0*	69.5	63.0
Valley	60.0	59.0*	43.0	45.5
West	85.0	85.0*	80.0	62.0
Cleveland	85.0	83.0*	74.0	45.0
Buffalo	71.0	63.5	66.0	54.0
Detroit	96.0	95.5*	67.0	51.0
South	71.0	70.5	72.0	56.0
South Ohio River	87.0	85.0*	85.5	58.0
Upper Ohio River	83.0	86.5*	72.5	60.0
St. Louis	88.0	87.5*	72.5	66.0
Aggregate	76.0	75.0	68.5	55.4

*Revised

Prices At a Glance

	This Week	Week Ago	Month Ago	Year Ago
(Cents per lb unless otherwise noted)				
Composite price				
Finished Steel, base	6.196	6.196	6.196	5.967
Pig Iron (gross ton)	\$66.41	\$66.41	\$66.41	\$66.42
Scrap No. 1 hvy				
(Gross ton)	\$41.17	\$40.50	\$39.83	\$34.33
No. 2 bundles	\$29.17	\$29.00	\$29.00	\$26.17
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	28.10
Copper, electrolytic	29.00	29.00	29.00	25.00
Lead, St. Louis	12.80	12.80	12.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	99.625	98.875*	99.125	91.625
Zinc, E. St. Louis	11.50	11.50	11.50	10.00

Hedging Begins in Plate Market

Plate users want to place tonnages ahead of any pre-strike stampede in buying.

Some are extending their order lead time to 30 days or even longer.

■ Chance of a steel strike next summer is forcing many steel plate users to play it safe. They're stocking up on inventory even though current orders are not heavy enough to justify a large stock buildup.

For most fabricators, the risk of being stuck with a lot of inventory isn't as frightening as the prospect of being unable to fill customer orders if the strike does come.

Scare Buying—As one plate buyer put it: "I don't know what I'll do with this plate when I get it. But I'm scared not to buy."

Actually, his inventory building will also serve as a hedge against a possible round of steel price increases this summer.

At the moment, the average plate buyer has extended his lead time from 30 to 45 days. Within the week, some buyers plan to extend their average order lead time 60-75 days. This despite the fact that considerable plate tonnage is available on 4 to 7 week delivery.

Mills Saw It Coming—Mills began warning customers late in 1958 to watch their plate stocks. The big rush began in December. Plate fabricators, followed in rapid succession by linepipe and rail car builders, stepped up their orders.

Where mills allowed booking of second quarter tonnage, buyers took the space then moved part of the tonnage up to the first quarter. Steel

service centers eyed the situation with general alarm and joined the parade.

Linepipe Influence—An executive for a large Midwestern steel service center admits: "We're actually heavy on plate inventory. But we're boosting our orders from the mill by 20-25 pct. We don't dare go into the second quarter without enough inventory to cushion us against a lot of plate demand from the linepipe people."

Reversal of the Memphis decision last month hasn't as yet produced a wild splurge of linepipe orders. But the splurge is sure to come, linepipe builders feel.

Car Builders Hedge—In a similar fix are the rail car builders. Spokesman for a major car builder estimates that "We'll probably increase our inventory by 30 pct during the first quarter."

At the same time, the company is taking work into its shops that originally was scheduled for the second quarter in order to "keep the shops busy." If a freight car buying program gets started in the second quarter, the company would have to buy against everybody who will be hedging against a strike.

Learned Their Lesson— "We were caught by a steel strike once before," the car builder spokesman said, "and we don't want to get caught again."

The buying rush is picking up speed in all plate widths and thicknesses. Wide plate already is tightening, with some mills sold out through the second quarter.

As it stands at the moment, the buildup in plate demand is due almost entirely to hedging. But whether or not it is used, plate is getting tighter.

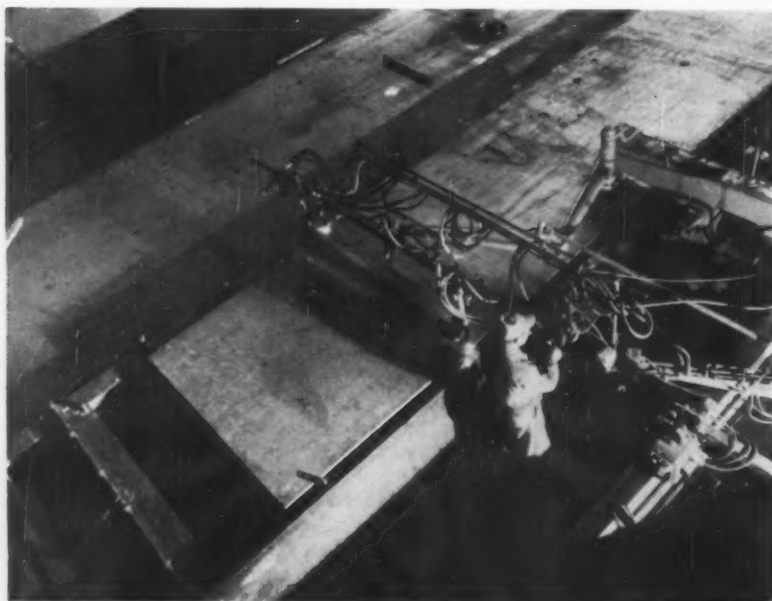


PLATE CUTTING: Fabricators are stepping up their plate orders to avoid shortages if a strike should come. (Baldwin-Lima-Hamilton Corp. photo.)



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Is 2nd Quarter Order Scramble Likely?

With mill space still available in first quarter, some users are busy booking second quarter tonnages.

Producers, concerned about an order squeeze, are trying to avoid overloading April-June order books.

■ Some steel users are worrying less about first quarter than they are about second. They are concentrating on placing second quarter tonnages as early as possible.

This trend is greatest in the Midwest. It involves oil country goods and sheet. But it shows signs of spreading to other markets and products. Many mills are concerned about a second quarter order scramble.

Along the East Coast, for instance, sheared mill plate can still be delivered in 2-3 weeks. Yet mills there are not anxious to book tonnages far ahead. One producer has put a 45-day lead time limit on all orders from here on in.

This same sort of concern exists among pipe mills. Several Midwest producers say they will not book any oil country casing for June delivery. Apparently they believe heavy April-May tonnages will bring them into June with carryovers. In that case they want to use June to clear up pending orders.

Mills can't be blamed for this caution after they study buying patterns. One oil country good buyer, for example, is getting in nine-months supply of steel during the first half. When this kind of thinking spreads, mills say, a serious

second quarter delivery bottleneck will develop.

Sheet and Strip — The strong demand for sheet in the **Midwest** has begun to spread eastward. **Pittsburgh** mills, for example, note increased activity. They are still able to handle more sheet business but one reports "there is not too much slack space available." **East Coast** mills have not yet been caught up in the sheet order flood. Some say January sheet tonnages may be below December levels.

In the **Chicago** market sheet is sold out for the first quarter. Mills there have lengthening carryovers on both hot- and cold-rolled. Now **Chicago** strip mills are also getting busier. One producer booked about three-quarters of February tonnage during a recent three-day period. Advance ordering for the second quarter is also a factor in the strip pickup.

Galvanized sheet orders at **East Coast** and **Pittsburgh** mills now stretch out through June. **West Coast** mills also report galvanized in heavy demand with appliance makers showing more order interest.

PURCHASING AGENT'S CHECKLIST

Auto parts suppliers face declining market and stiffer competition.

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Scrap industry prepares to battle its long-term problems.

P. 26

Founders are confident of better year, but still sharpen their sales weapons.

P. 28

Plate—Customers in the **Chicago** area are still building plate inventories. Some have boosted their first quarter needs by as much as 100 pct. A second **Midwest** mill is booked to capacity on sheared mill plate through February.

Plate mills on the **East Coast** and at **Pittsburgh** expect this Midwest strength to move in their direction soon. An **East Coast** plate mill is still operating at only nine turns a week. There's also plenty of space on **Pittsburgh** mills. Yet even these producers see a possible sales squeeze in the second quarter. "We don't want to accept any orders beyond a 45-day lead time," says one sales official. "The outlook from there on is too uncertain for firm commitments," he adds.

Structurals — Sales continue to lag behind general market levels. More buying is expected in the second quarter as users begin hedging against a possible steel strike. **West Coast** structural mills are reducing inventories as buying picks up.

Stainless Prices—U. S. Steel last week announced price increases, effective Jan. 14, for rerolling slabs and ingots, forging billets, bars, rod, and cold finished wire. With this action virtually all producers have followed the price advances first made by Crucible Steel in mid-December. (New stainless prices are on p. 116.)

Pipe and Tubing — Second quarter orders, rather than first, are getting major attention from some casing and tubing buyers. In some cases mills have booked more tonnage for May than they have for February or March.

Linepipe orders, on the contrary, are described as "only fair" by one **Pittsburgh** area producer. Mills there still have space available for first half orders. In addition, few linepipe projects are close enough to the ordering stage to do the mills any good.

COMPARISON OF PRICES

(Effective Jan. 29, 1959)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Jan. 20 1959	Jan. 13 1959	Dec. 22 1958	Jan 21 1958
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.18¢	5.10¢	5.10¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.275	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.60
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30	5.12
Plates, wrought iron	13.55	13.55	13.55	13.15
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$10.65	\$10.65	\$10.65	\$10.30
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.00
Special coated mfg. ternes	9.90	9.90	9.90	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.425¢
Cold finished bar	7.65	7.65	7.65	7.30
Alloy bars	6.725	6.725	6.725	6.475
Structural shapes	5.50	5.50	5.50	5.275
Stainless bars (No. 302)	45.00	45.00	45.00	45.00
Wrought iron bars	14.90	14.90	14.90	14.45
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	7.65¢
Rails: (per 100 lb.)				
Heavy rails	\$5.75	\$5.75	\$5.75	\$5.525
Light rails	6.725	6.725	6.725	6.50
Semifinished Steel: (per net ton)				
Re-rolling billets	\$80.00	\$80.00	\$80.00	\$77.50
Slabs, re-rolling	80.00	80.00	80.00	77.50
Forging billets	99.50	99.50	99.50	96.00
Alloy blooms, billets, slabs	119.00	119.00	119.00	114.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.15¢
Skelp	5.05	5.05	5.05	4.875
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	5.967¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	Jan. 20 1959	Jan. 13 1959	Dec. 22 1958	Jan. 21 1958
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$70.57	\$70.57	\$70.57	\$70.51
Foundry, Southern Cin'ti	73.87	73.87	73.87	71.65
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.01
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	\$66.41	\$66.41	66.41	\$66.42
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$45.50	\$43.50	\$42.50	\$32.50
No. 1 steel, Phila. area	35.50	35.50	33.50	38.00
No. 1 steel, Chicago	42.50	42.50	43.50	32.50
No. 1 bundles, Detroit	36.50	36.50	35.50	22.50
Low phos., Youngstown	46.00	46.00	44.50	35.50
No. 1 mach'y cast, Pittsburgh	51.50	50.50	50.50	49.50
No. 1 mach'y cast, Phila.	48.50	48.50	48.50	47.50
No. 1 mach'y cast, Chicago	54.50	54.50	53.50	47.50
Steel Scrap Composites: (per gross ton)				
No. 1 hvy. melting scrap	\$41.17	\$40.50	\$39.83	\$34.33
No. 2 bundles	29.17	29.00	29.00	26.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$14.50	\$14.50	\$14.50	\$15.38
Foundry coke, prompt	\$18-18.50	\$18-18.50	\$18-18.50	\$17.50-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.00	29.00	29.00	25.00
Copper, Lake, Conn.	29.00	29.00	29.00	25.00
Tin, Straits, N. Y.	99.625†	98.875*	99.125	91.625
Zinc, East St. Louis	11.50	11.50	11.50	10.00
Lead, St. Louis	12.80	12.80	12.80	12.80
Aluminum, virgin ingot	26.80	26.80	26.80	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. ‡ Average. * Revised.

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New Upsurge Looms In Scrap Prices

It looks like the long-looked-for market upturn has started.

Stronger prices and renewed mill interest in scrap is reported in most districts.

■ All signs point to at least a mild boom in the scrap market.

Mill business is picking up at a steady pace and widespread buying of scrap is due soon in the East, Pittsburgh, and the Valley. The Chicago market is stronger and export activity is up.

Throughout most districts, dealers are proving their bullishness by resisting current prices. Brokers, consequently, are wary of committing themselves to large tonnages.

Already the Cleveland and Valley markets are fairly well cleaned out of prime scrap. Brokers there are drawing these grades from the East and are laying it down in anticipation of higher prices.

A surefire tipoff that the long-awaited upturn has started in earnest is the state of the market in Pittsburgh. Primary openhearth scrap prices there moved up \$2 this week, based on broker sentiment. Even blast furnace scrap prices showed a \$1 increase, reflecting a general increase in steel mill activity.

Based on Pittsburgh strength, The IRON AGE No. 1 heavy melting Composite Price rose 67¢ to \$41.17.

Pittsburgh—The price of No. 1 heavy melting is up \$2 here. Prices of No. 2 openhearth grades are up

\$1. No orders had been placed at the higher levels earlier this week, but brokers are confident business is available now at higher prices. A sharp pickup in mill activity over the last 10 days has put consumers in a buying mood. Brokers are reluctant to commit themselves for heavy tonnages because of bullish sentiment among dealers. Turnings are up \$1 as yards raise their buying prices. Brokers are quoting the equivalent of \$46 delivered for cupola cast.

Chicago — Railroad lists continued to move at strong prices and a general feeling of strength in the market is confirmed by continuing high prices being paid for factory lists. Mill purchasing was general and the price range of their "offer-to-buy" was wide. Broker buying prices continue firm and at a relatively high level. There is no evidence at the moment, however, of the runaway market which some had expected as recently as two weeks ago.

Philadelphia—There is an undercurrent of strength here. Probability is high that new sales of openhearth scrap will be made to local mills before the end of the week at higher prices. The first export order in many months has been filled. Turnings also are starting to move. A sale of shoveling turnings was made at \$23.

New York—No. 2 heavy melting has followed the \$1 rise in No. 1 last week. Strength has come from some export activity bolstered by small orders from domestic mills.

Prices are unchanged for other grades, but the trade is looking for new business soon.

Detroit—No new activity is noticeable in this market, but there is evidence of growing price resistance from dealers as they approach the end of the month.

Cleveland—Special tonnages of high grade scrap can be moved and demand is fairly good, but dealers are being left behind in the current market. Tonnage is moving on prime grades for specified lots.

St. Louis — A stronger undertone prevails, but prices are mostly unchanged. Rerolling rails are up \$1 at \$59 to \$60. Dealers are holding on to material in hopes of higher prices.

Birmingham — After a small flurry of buying the first week in January, the scrap market in this district has again quieted down. Consumers continue to buy small quantities at going prices.

Cincinnati—Some dealer material is bringing slightly higher prices as brokers clean up old orders. But the market generally is slow. Outlook for next month is brighter with slightly higher prices.

Buffalo—This market is firm but quiet. A crippling snowstorm brought yard activity to a virtual halt.

Boston—New orders for primary openhearth grades at \$3 higher have changed the outlook here. The trade is optimistic. No. 2 bundles sold for \$16, an increase of \$2.

West Coast — Activity is at a standstill in all three coastal districts. Many dealers believe it will be quiet for another month. Export orders are being filled easily.

Houston — The market is quiet and most prices unchanged. Brokers are anticipating increased export buying soon at considerably higher prices. Cut structurals and plate were sold locally at \$32, or \$3 below last week's price.

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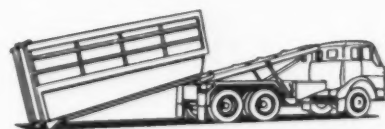
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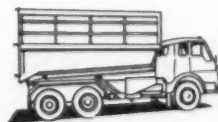
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APPROACH

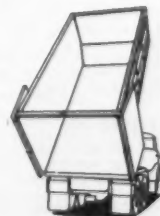


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EXPORT SALES: BORG-WARNER INTERNATIONAL CORPORATION, CHICAGO

SCRAP PRICES (Effective Jan. 20, 1959)

Pittsburgh

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	45.00 to 46.00
No. 1 factory bundles	49.00 to 50.00
No. 2 bundles	32.00 to 33.00
No. 1 busheling	45.00 to 46.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Low phos. punch'gs plate	49.00 to 50.00
Heavy turnings	37.00 to 38.00
No. 1 RR hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	54.00 to 55.00
Rails 2 ft and under	57.00 to 58.00
RR specialties	50.00 to 51.00
No. 1 machinery cast.	51.00 to 52.00
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	43.00 to 44.00
Stainless	
18-8 bundles and solids	225.00 to 230.00
18-8 turnings	120.00 to 125.00
430 bundles and solids	125.00 to 130.00
430 turnings	50.00 to 60.00

Chicago

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	43.00 to 44.00
No. 1 factory bundles	46.00 to 47.00
No. 2 bundles	30.00 to 32.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	23.00 to 24.00
Low phos. forge crops	52.00 to 53.00
Low phos. punch'gs plate	49.00 to 50.00
Low phos. 3 ft and under	47.00 to 48.00
No. 1 RR hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	52.00 to 53.00
Revolting rails	63.00 to 64.00
Rails 2 ft and under	59.00 to 60.00
Angles and splice bars	54.00 to 55.00
RR steel car axles	71.00 to 72.00
RR couplers and knuckles	51.00 to 52.00
No. 1 machinery cast.	54.00 to 55.00
Cupola cast.	48.00 to 49.00
Heavy breakable cast.	42.00 to 43.00
Cast iron wheels	43.00 to 44.00
Malleable	57.00 to 58.00
Stove plate	44.00 to 45.00
Steel car wheels	53.00 to 54.00
Stainless	
18-8 bundles and solids	215.00 to 220.00
18-8 turnings	125.00 to 130.00
430 bundles and solids	115.00 to 120.00
430 turnings	60.00 to 65.00

Philadelphia Area

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	23.50 to 24.50
No. 1 busheling	35.00 to 36.00
Machine shop turn.	18.00 to 19.00
Mixed bor. short turn.	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Shoveling turnings	21.00 to 22.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	40.00 to 41.00
Low phos. 2 ft punch'gs	41.00 to 42.00
Elec. furnace bundles	38.00 to 39.00
Heavy turnings	31.00 to 32.00
RR specialties	43.00 to 44.00
Rails 18 in. and under	57.00 to 58.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	40.00 to 41.00
Cast iron car wheels	44.00 to 45.00
Malleable	61.00 to 62.00
No. 1 machinery cast.	48.00 to 49.00

Cincinnati

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	18.00 to 19.00
Low phos. 18 in. and under	47.00 to 48.00
Rails, random length	49.00 to 50.00
Rails, 18 in. and under	55.00 to 56.00
No. 1 cupola cast.	44.00 to 45.00
Hvy. breakable cast.	39.00 to 40.00
Drop broken cast.	47.00 to 48.00

Youngstown

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	44.00 to 45.00
No. 2 bundles	30.00 to 31.00
Machine shop turn.	19.50 to 20.50
Shoveling turnings	19.50 to 20.50
Low phos. plate	45.50 to 46.50

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	\$40.50 to \$41.50
No. 2 hvy. melting	32.50 to 33.50
No. 1 dealer bundles	40.50 to 41.50
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	26.50 to 27.50
No. 1 busheling	40.50 to 41.50
Machine shop turn.	13.50 to 16.50
Mixed bor. and turn.	20.50 to 21.50
Shoveling turnings	20.50 to 21.50
Cast iron borings	20.50 to 21.50
Cut structural & plates, 2 ft & under	48.00 to 49.00
Drop forge flashings	40.50 to 41.50
Low phos. punch'gs plate	41.50 to 42.50
Foundry steel, 2 ft & under	40.00 to 41.00
No. 1 RR hvy. melting	47.00 to 48.00
Rails 2 ft and under	56.00 to 57.00
Rails 18 in. and under	57.00 to 58.00
Steel axle turnings	26.00 to 27.00
Railroad cast.	52.00 to 53.00
No. 1 machinery cast.	50.00 to 51.00
Stove plate	47.00 to 48.00
Malleable	61.00 to 62.00
Stainless	
18-8 bundles	215.00 to 220.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 busheling	36.00 to 37.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	15.00 to 16.00
Low phos. plate	40.00 to 41.00
Structurals and plate 2 ft and under	44.00 to 45.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	56.00 to 57.00
No. 1 machinery cast.	48.00 to 49.00
No. 1 cupola cast.	44.00 to 45.00

St. Louis

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	22.00 to 23.00
No. 1 RR hvy. melting	43.00 to 44.00
Rails, random lengths	47.00 to 48.00
Rails, 18 in. and under	52.00 to 53.00
Angles and splice bars	46.00 to 47.00
RR specialties	46.00 to 47.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	38.00 to 39.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	44.00 to 45.00
Cast iron car wheels	44.00 to 45.00
Revolting rails	59.00 to 60.00
Unstripped motor blocks	39.00 to 40.00

Birmingham

No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	21.00 to 22.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	37.00 to 38.00
Elec. furnace, 3 ft & under	34.00 to 35.00
Bar crops and plate	42.00 to 43.00
Structural and plate, 2 ft.	41.00 to 42.00
No. 1 RR hvy. melting	38.00 to 39.00
Scrap rails, random lgth.	42.00 to 43.00
Rails, 18 in. and under	42.00 to 43.00
Angles and splice bars	42.00 to 43.00
Revolting rails	56.00 to 57.00
No. 1 cupola cast.	53.00 to 54.00
Stove plate	41.00 to 42.00
Cast iron car wheels	41.00 to 42.00
Unstripped motor blocks	40.00 to 41.00

New York

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	18.00 to 19.00
No. 2 dealer bundles	10.00 to 11.00
Machine shop turnings	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	23.00 to 24.00
Clean chem. cast. borings	37.00 to 38.00
No. 1 machinery cast.	35.00 to 36.00
Mixed yard cast.	32.00 to 33.00
Heavy breakable cast.	185.00 to 190.00
Stainless	
18-8 prepared solids	80.00 to 85.00
18-8 turnings	65.00 to 70.00
430 prepared solids	20.00 to 25.00
430 turnings	

Detroit

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	33.00 to 34.00
Drop forge flashings	13.00 to 14.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Heavy breakable cast.	33.00 to 34.00
Mixed cupola cast.	41.00 to 42.00
Automotive cast.	46.00 to 47.00
Stainless	
18-8 bundles and solids	205.00 to 210.00
18-8 turnings	100.00 to 105.00
430 bundles and solids	105.00 to 110.00

Boston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	27.00 to 28.00
No. 2 bundles	15.00 to 16.00
No. 1 busheling	27.00 to 28.00
Machine shop turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	18.00 to 19.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	29.00 to 30.00
Stove plate	29.00 to 30.00

San Francisco

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	30.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 cupola cast.	45.00

Los Angeles

No. 1 hvy. melting	\$36.00
No. 2 hvy. melting	34.00
No. 1 dealer bundles	33.00
No. 2 bundles	18.00
Machine shop turn.	17.00
Shoveling turnings	17.00
Cast iron borings	17.00
Elec. turn. 1 ft and under (foundry)	47.00
No. 1 cupola cast.	47.00

Seattle

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$34.50
No. 2 hvy. melting	30.50
No. 1 dealer bundles	34.50
No. 2 bundles	25.00
Mixed steel scrap	34.50
Bush., new fact., prep'd.	28.50
Machine shop turn.	13.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Rails, rerolling	37.00
Cast scrap	\$39.00 to 41.00

Houston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$33.00
No. 2 hvy. melting	30.00
No. 2 bundles	22.50
Machine shop turn.	15.00
Shoveling turnings	19.00
Cut structural plate 2 ft & under	\$42.00 to 43.00
Unstripped motor blocks	31.00 to 32.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	26.50 to 27.50

for the purchase or sale of *scrap*



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Has Cuban Revolt Affected Nickel?

On the surface the answer appears to be "no."

But both U. S. nickel interests in Cuba have concessions from Batista that will come under close scrutiny.

At first glance, the revolution in Cuba appears to have affected the island's nickel industry very little. This may be the case, but it will be some time before anyone can say for sure. All the returns aren't in.

Most vulnerable is Freeport Nickel Co., now building a plant at Moa Bay. Although the construction is in Oriente Province, the rebel stronghold even during Castro's darkest hour, little damage was done.

Tax Break—Freeport got a partial tax exemption from the Batista government under Cuban Law Decree 1038. For a limited period Freeport will pay a little less than 20 pct of its profits in taxes instead of the usual 50 pct.

The law is aimed at luring new industry to Cuba. One of the things that recommended Freeport is the fact that cobalt will be produced along with the nickel. This will be the first cobalt to come from Cuba.

Also a problem: Nationalization is a word that is being whispered in many official Cuban corridors these days.

Business as Usual—To date the change in government has brought no change for Freeport. Right after the Castro victory was assured, an unofficial rebel delegation visited the plant site. Management was told

to proceed as if nothing had happened.

On the other hand, Castro has indicated he will review all commitments made to private companies by the previous government. Reports from Cuba say a three-man commission for this purpose has been formed.

At the U. S. government-owned nickel plant at Nicaro, things got a little touchy during the fighting. At one point the rebels held the mine while the government troops held the plant. But the only loss was a parts warehouse. Now production is going ahead on schedule.

No Change at Nicaro—Castro has notified the State Dept. that he will honor his international government-to-government commitments. This has been taken to mean there will be no change.

The problem is that the U. S. government has been trying to sell the plant, in which it has invested about \$95 million, to private industry. Now all profit taxes are waived on the Nicaro operation.

General Services Administration, in charge of the sale, is not likely to get any bidders until the Castro government makes a commitment on taxes, and on the threat of nationalization.

1959 Outlook

An aluminum man this week called the shots for copper, lead, zinc, titanium, and magnesium, as well as his own metal.

At a meeting of the National Industrial Conference Board in New

York, I. W. Wilson, chairman of Aluminum Co. of America, said aluminum consumption in 1959 will be a minimum of 10 pct above last year, and could easily be 15 to 20 pct higher.

Here's how the Alcoa head sees other nonferrous metals:

Copper—Increased industrial activity in 1959 will result in shipments probably 10 to 15 pct better than 1958. The supply situation is the best it's been in years. This should make copper less sensitive.

Lead—Storage batteries will lead a list of users in taking about 5 to 10 pct more shipments in 1959 than last year. The gap between supply and demand will be narrowed, promoting better price stability.

Zinc—Auto and steel industries will be the main factors in improving 1959 shipments more than 10 pct over last year.

Magnesium and Titanium—Defense cutbacks made 1958 a bad year for both metals, but the 1959 outlook for both is bright. Magnesium demand may be up as much as 20 pct.

Tin prices for the week: Jan. 14—98.875; Jan. 15—98.75; Jan. 16—99.375; Jan. 19—99.625; Jan. 20—99.625.*

* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/58
Aluminum Ingot	26.00	26.10	8/1/58
Copper (E)	29.00	27.50	10/23/58
Copper (CS)	29.50	29.00	1/12/59
Copper (L)	29.00	27.50	10/23/58
Lead, St. L.	12.50	12.30	10/14/58
Lead, N. Y.	13.00	12.50	10/14/58
Magnesium Ingot	36.00	34.00	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.00	12/6/58
Titanium sponge	182-182	185-205	11/3/58
Zinc, E. St. L.	11.50	11.00	11/7/58
Zinc, N. Y.	12.00	11.50	11/7/58

ALUMINUM: 99% Ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. Tin: See above; Other primary prices, pg. 109.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship pt., frt. allowed)

Flat Sheet (Mill Finish and Plate)

("P" temper except 6061-0)

Alloy	.032	.081	.136 .249	250- 3
1100, 3003	45.7	43.8	42.8	43.3
5052	53.1	48.4	46.9	46.0
6061-0	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	42.7-44.2	51.1-54.8
12-14	42.7-44.2	52.0-56.5
24-26	43.2-44.7	52.8-57.5
36-38	46.7-49.2	56.9-60.5

Screw Machine Stock—2011-T-3

Size*	3/4	3/4-5/8	3/4-1	1 1/4-1 1/2
Price	62.0	61.2	59.7	57.8

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length*→	72	96	120	144
.019 gage	\$1.411	\$1.884	\$2.353	\$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→	Gage→	.250 3.00	.250- 2.00	.188	.081	.032
AZ31B Stand, Grade		67.9	69.0	77.9	106.1	
AZ31B Spec.		93.3	95.7	108.7	171.8	
Tread Plate		70.6	71.7			
Tooling Plate	73.0					

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velma, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

"A" Nickel Monel Inconel

	Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	128
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	87		

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	53.13		50.36	53.32
Brass, Yellow	46.57	47.11	46.51	49.98
Brass, Low	49.23	49.77	49.17	52.54
Brass, R L	50.17	50.71	50.11	53.48
Brass, Naval	51.24		45.05	54.65
Muntz Metal	49.35		44.66	
Comm. Br.	51.65	52.19	51.59	54.71
Mang. Br.	54.94		48.64	
Phos. Br. 5%	72.52		73.09	

Free Cutting Brass Rod 31.22

TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, \$6.90-\$7.40; alloy, \$14.35; Plate, HR, commercially pure, \$5.00-\$5.75; alloy, \$7.75-\$8.50. Wire, rolled and/or drawn, commercially pure, \$5.50-\$6.00; alloy, \$8.00-\$9.50; Bar, HR or forged, commercially pure, \$4.25-\$4.65; alloy, \$4.25-\$7.15; billets, HR, commercially pure, \$3.55-\$4.10; alloy, \$3.55-\$5.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex., 29.50
Beryllium aluminum 5% Be, Dollar
per lb contained Be \$74.75
Beryllium copper, per lb contained Be \$43.00
Beryllium 97% lump or beads,
f.o.b. Cleveland, Reading \$71.50
Bismuth, ton lots \$2.25
Cadmium, del'd \$1.45
Calcium, 99.9% small lots \$4.55
Chromium, 99.8% metallic basis \$1.31
Cobalt, 97-99% (per lb) \$2.00 to \$2.07
Germanium, per gm, f.o.b. Miami,
Okla., refined \$35.00 to \$42.00
Gold, U. S. Treas., per troy oz. \$35.00
Indium, 99.9% dollars per troy oz. \$2.25
Iridium, dollars per troy oz. \$70 to \$80
Lithium, 98% \$11.00 to \$14.00
Magnesium, sticks, 100 to 500 lb., 59.00
Mercury, dollars per 76-lb flask,
f.o.b. New York \$215 to \$221
Nickel oxide sinter at Buffalo, N. Y.,
or other U. S. points of entry,
contained nickel 69.60
Palladium, dollars per troy oz. \$15 to \$17
Platinum, dollars per troy oz. \$50 to \$55
Rhodium \$120.00 to \$125.00
Silver ingots (¢ per troy oz.) 90.125
Thorium, per kg. \$43.00
Vanadium \$3.45
Zirconium sponge \$5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 Ingot	
No. 115	28.00
No. 120	27.00
No. 123	26.00
80-10-10 Ingot	
No. 305	32.25
No. 315	30.25
88-10-2 Ingot	
No. 210	39.75
No. 215	35.50
No. 245	32.25
Yellow Ingot	
No. 405	23.00
Manganese bronze	
No. 421	24.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.	24.75-25.00
0.60 copper max.	24.50-24.75
Piston alloys (No. 122 type)	24.25-25.25
No. 12 alum. (No. 2 grade)	21.50-22.00
108 alloy	22.00-22.50
195 alloy	25.00-26.00
13 alloy (0.60 copper max.)	24.25-24.75
AXS-679 (1 pct zinc)	21.75-22.25

Steel deoxidizing aluminum notch bar
granulated or shot

Grade 1—95-97 1/2%	22.50-23.50
Grade 2—92-95%	21.25-22.25
Grade 3—90-92%	20.25-21.25
Grade 4—85-90%	17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for
shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	25	24 1/2
Yellow brass	19	17 1/2
Red brass	22 1/2	21 1/2
Comm. bronze	22 1/2	22 1/2
Mang. bronze	17 1/2	16 1/2
Free cutting rod ends	18 1/2	

Customs Smelters Scrap

(Cents per pound carload lots, delivered
to refinery)

No. 1 copper wire	25 3/4
No. 2 copper wire	23 3/4
Light copper	21 3/4
*Refinery brass	23 3/4
Copper bearing material	22 3/4
*Dry copper content	

Ingot Makers Scrap

(Cents per pound carload lots, delivered
to refinery)

No. 1 copper wire	25 3/4
No. 2 copper wire	23 3/4
Light copper	21 3/4
No. 1 composition	20
No. 1 comp. turnings	19 1/2
Hvy. yellow brass solids	14 1/2
Brass pipe	16
Radiators	16 1/2

Aluminum

Mixed old cast	12 — 13
Mixed new clips	15 — 16
Mixed turnings, dry	13 — 14

Dealers' Scrap

(Dealers' buying price f.o.b. New York
in cents per pound)

Copper and Brass

No. 1 copper wire	23 — 23 1/2
No. 2 copper wire	21 — 21 1/2
Light copper	19 — 19 1/2
Auto radiators (unsweated)	13 3/4 — 14 1/4
No. 1 composition	17 — 17 1/2
No. 1 composition turnings	16 — 16 1/2
Cocks and faucets	14 — 14 1/2
Clean heavy yellow brass	12 1/4 — 12 3/4
Brass pipe	14 — 14 1/2
New soft brass clippings	14 1/2 — 15
No. 1 brass rod turnings	12 — 12 1/2

Aluminum

Alum. pistons and struts	6 — 6 1/2
Aluminum crankcases	9 1/2 — 10
1100 (2s) aluminum clippings	13 — 13 1/2
Old sheet and utensils	6 — 6 1/2
Borings and turnings	9 1/2 — 10
Industrial castings	11 — 11 1/2
2020 (24S) clippings	11 — 11 1/2

Zinc

New zinc clippings	4 3/4 — 5 1/4
Old zinc	3 1/2 — 3 3/4
Zinc routings	2 1/2 — 2 3/4
Old die cast scrap	2 — 2 1/4

Nickel and Monel

Pure nickel clippings	52-54
Clean nickel turnings	37-40
Nickel anodes	52-54
Nickel rod ends	52-54
New Monel clippings	30-32
Clean Monel turnings	30-32
Old sheet Monel	26-28
Nickel silver clippings, mixed	18
Nickel silver turnings, mixed	15

Lead

Soft scrap lead	8 — 8 1/4
Battery plates (dry)	2 3/4 — 3
Batteries, acid free	2 1/2 — 2 3/4

Miscellaneous

Block tin	75 — 76
No. 1 pewter	59 — 60
Auto babbit	39 — 40
Mixer common babbit	9 1/2 — 10
Solder joints	13 1/4 — 13 3/4
Siphon tops	42
Small foundry type	10 1/2 — 10 3/4
Monotype	10 1/2 — 10 3/4
Lino. and stereotype	9 1/2 — 9 3/4
Electrotype	8 1/2 — 8 3/4
Hand picked type shells	6 1/2 — 7
Lino. and stereo. dross	2 3/4 — 3
Electro dross	2 1/4 — 2 1/2

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL
PRICES

	BILLETS, BLOOMS, SLABS			PIL- ING	SHAPES STRUCTURALS			STRIP					
	Carbon Reolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
EAST	Bethlehem, Pa.		\$119.00 B3		5.55 B3	8.10 B3	5.55 B5						
	Buffalo, N. Y.	\$80.00 R3, B3	\$99.50 R3, B3	\$119.00 R3, B3	6.50 B3	5.55 B3	8.10 B3	5.55 B3	5.10 B3, R3	7.425 S10, R7	7.575 B3		
	Phila., Pa.								7.875 P15				
	Harrison, N. J.												15.55 C11
	Conschocken, Pa.		\$104.50 A2	\$126.00 A2				5.15 A2		7.575 A2			
	New Bedford, Mass.								7.875 R6				
	Johmatown, Pa.	\$80.00 B3	\$99.50 B3	\$119.00 B3		5.55 B3	8.10 B3						
	Boston, Mass.								7.975 T8				
	New Haven, Conn.								7.875 D1				
	Baltimore, Md.								7.425 T8				15.90 T8
	Phoenixville, Pa.				5.55 P2		5.55 P2						
	Sparrows Pt., Md.							5.10 B3		7.575 B3			
MIDDLE WEST	New Britain, Bridgeport, Wallingford, Conn.		\$119.00 N8						7.875 W1, S7				
	Pawtucket, R. I. Worcester, Mass.								7.975 N7, A5				15.90 N7 15.70 T8
	Alton, Ill.							5.30 L1					
	Ashland, Ky.							5.10 A7		7.575 A7			
	Canton-Massillon, Dover, Ohio		\$102.00 R5	\$119.00 R3, \$114.00 T5					7.425 G4		10.80 G4		
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	\$80.00 U1, R3	\$99.50 U1, R3, W8	\$119.00 U1, R3, W8	6.50 U1	5.50 U1, W8, P13	8.05 U1, Y1, W8	5.50 U1	5.10 W8, N4, A1	7.525 A1, T8, M8	7.575 W8	8.40 W8, S9, J3	15.55 A1, S9, G4, T8
	Cleveland, Ohio								7.425 A5, J3		10.75 A5	8.40 J3	
	Detroit, Mich.			\$119.00 R5				5.10 G3, M2	7.425 M2, S1, D1, P11	7.575 G3	10.80 S1		
	Anderson, Ind.								7.425 G4				
	Gary, Ind. Harbor, Indiana	\$80.00 U1	\$99.50 U1	\$119.00 U1, Y1		5.50 U1, J3	8.05 U1, J3	5.50 J3	5.10 U1, J3, Y1	7.425 Y1	7.575 U1, J3, Y1	10.90 Y1	8.40 U1, Y1
	Sterling, Ill.	\$80.00 N4				5.50 N4		5.20 N4					
WEST	Indianapolis, Ind.								7.575 R5				15.70 R5
	Newport, Ky.							5.10 A9				8.40 A9	
	Niles, Warren, Ohio Sharon, Pa.		\$99.50 S1, C10	\$119.00 C10, S1				5.10 R3, S1	7.425 R3, T4, S1	7.575 R3, S1	10.80 R3, S1	8.40 S1	15.55 S1
	Owensboro, Ky.	\$80.00 G5	\$99.50 G5	\$119.00 G5									
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	\$80.00 U1, P6	\$99.50 U1, C11, P6	\$119.00 U1, C11, B7	6.50 U1	5.50 U1, J3	8.05 U1, J3	5.50 U1	5.10 P6	7.425 J3, B4 7.525 E3		8.40 S9	15.55 S9
	Weirton, Wheeling, Follinsbee, W. Va.				6.50 U1, W3	5.50 W3		5.50 W3	5.10 W3	7.425 F3	7.575 W3	10.80 W3	
	Youngstown, Ohio	\$80.00 R3	\$99.50 Y1, C10	\$119.00 Y1			8.05 Y1		5.10 U	7.425 Y1, R5	7.575 U1, Y1	10.95 Y1	8.40 U1, Y1
	Fontana, Cal.	\$90.50 K1	\$109.00 K1	\$140.00 K1		6.30 K1	8.85 K1	6.45 K1	5.825 K1	9.20 K1			
	Geneva, Utah		\$99.50 C7			5.50 C7	8.05 C7						
	Kansas City, Mo.					5.60 S2	8.15 S2					8.45 S2	
	Los Angeles, Torrance, Cal.		\$109.00 B2	\$139.00 B2		6.20 C7, B2	8.75 B2		5.85 C7, B2	9.30 C1, R5		9.60 B2	17.75 J3
SOUTH	Minneapolis, Colo.					5.80 C6			6.20 C6	9.375 C6			
	Portland, Ore.					6.25 O2							
	San Francisco, Niles, Pittsburg, Cal.		\$109.00 B2			6.15 B2	8.70 B2		5.85 C7, B2				
	Seattle, Wash.		\$113.00 B2			6.25 B2	8.80 B2		6.10 B2				
	Atlanta, Ga.					5.70 A8			5.10 A8				
	Fairfield, Ala. City, Birmingham, Ala.	\$80.00 T2	\$99.50 T2			5.50 T2 R3, C16	8.05 T2		5.10 T2, R3, C16		7.575 T2		
	Houston, Lone Star, Texas		\$104.50 S2	\$124.00 S2		5.60 S2	8.15 S2					8.45 S2	

(Effective Jan. 19, 1959)

THE IRON AGE, January 22, 1959

IRON AGE

STEEL
PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES		SHEETS							WIRE ROD	TINPLATE†		Holloware Enameling 29 ga.	
		Hot-rolled 18 ga. & hvyr.	Cold- rolled	Galvanized (Hot-dipped)	Enamel- ing	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.		Hi Str. Low Alloy Galv.	Cokes* 1.25 lb. base box		Electro** 0.25 lb. base box
EAST	Buffalo, N. Y.	5.10 B3	6.275 B3				7.525 B3	9.275 B3		6.40 W6	† Special coated mfg. terne deduct 35c from 1.25 lb. coke base box price, 0.75 lb. 0.25 lb. add 55c. Can-making quality BLACKPLATE 55 to 128 lb. deduct \$2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25c. **ELECTRO: 0.50-lb. add 25c; 0.75 lb. add 65c; 1.00-lb. add \$1.00. Differential 1.00 lb. 0.25 lb. add 65c.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 A2	6.325 A2				7.575 A2						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.								6.40 B3				
	Fairless, Pa.	5.15 U1	6.325 U1				7.575 U1	9.325 U1			\$10.50 U1	\$9.20 U1	
	New Haven, Conn.												
	Phoenixville, Pa.												
MIDDLE WEST	Sparrows Pt., Md.	5.10 B3	6.275 B3	6.875 B3			7.525 B3	9.275 B3	10.025 B3	6.50 B3	\$10.40 B3	\$9.10 B3	
	Worcester, Mass.									6.70 A5			
	Trenton, N. J.												
	Alton, Ill.									6.60 L1			
	Ashland, Ky.	5.10 A7		6.875 A7	6.775 A7		7.525 A7						
	Canton-Massillon, Dover, Ohio			6.875 R1, R3									
	Chicago, Joliet, Ill.	5.10 W8, A1					7.525 U1, W8			6.40 A5, R3, W8			
	Sterling, Ill.									6.50 N4, K2			
	Cleveland, Ohio	5.10 R3, J3	6.275 R3, J3	7.65 R3*	6.775 R3		7.525 R3, J3	9.275 R3, J3		6.40 A5			
	Detroit, Mich.	5.10 G3, M2	6.275 G3, M2				7.525 G3	9.275 G3					
WEST	Newport, Ky.	5.10 A1	6.275 A1										
	Gary, Ind. Harbor, Indiana	5.10 U1, I3, Y1	6.275 U1, I3, Y1	6.875 U1, I3	6.775 U1, I3, Y1	7.225 U1	7.525 U1, Y1, I3	9.275 U1, Y1		6.40 Y1	\$10.40 U1, Y1	\$9.10 I3, U1, Y1	7.85 U1, Y1
	Granite City, Ill.	5.20 G2	6.375 G2	6.975 G2	6.875 G2							\$9.20 G2	7.95 G2
	Kokomo, Ind.			6.975 C9						6.50 C9			
	Mansfield, Ohio	5.10 E2	6.275 E2			7.225 E2							
	Middletown, Ohio		6.275 A7	6.875 A7	6.775 A7	7.225 A7							
	Niles, Warren, Ohio Sharon, Pa.	5.10 R3, S1	6.275 R3	6.875 R3, 7.65 R3*	6.775 S1	7.225 S1*, R3	7.525 R3, S1	9.275 R3, S1				\$9.10 R3	
	Pittsburgh, Midland, Butler, Denora, Aliquippa, McKeesport, Pa.	5.10 U1, J3, P6	6.275 U1, J3, P6	6.875 U1, J3, 7.50 E3*	6.775 U1		7.525 U1, J3	9.275 U1, J3	10.025 U1, J3	6.40 A5, J3, P6	\$10.40 W5, J3	\$9.10 U1, J3	7.85 U1, J3
	Portsmouth, Ohio	5.10 P7	6.275 P7							6.40 P7			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 W3, W5	6.275 W3, F3, W5	6.875 W3, W5, 7.50 W3*		7.225 W3, W5	7.525 W3	9.275 W3			\$10.40 W5, W3	\$9.10 W5, W3	7.85 W5
SOUTH	Youngstown, Ohio	5.10 U1, Y1	6.275 Y1	7.50 J3*	6.775 Y1		7.525 Y1	9.275 Y1		6.40 Y1			
	Fontana, Cal.	5.825 K1	7.40 K1				8.25 K1	10.40 K1			\$11.05 K1	\$9.75 K1	
	Geneva, Utah	5.20 C7											
	Kansas City, Mo.									6.65 S2			
	Los Angeles, Torrance, Cal.									7.20 B2			
	Minnequa, Colo.									6.65 C6			
	San Francisco, Niles, Pittsburg, Cal.	5.80 C7	7.225 C7	7.625 C7						7.20 C7	\$11.05 C7	\$9.75 C7	
	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 T2, R3	6.275 T2, R3	6.875 T2, R3	6.775 T2					6.40 T2, R3	\$10.50 T2	\$9.20 T2	
	Houston, Texas									6.65 S2			

* Electrogalvanized sheets.

(Effective Jan. 19, 1959)

* 7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL
PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 B3	9.025 B3	8.30 B3					
	Buffalo, N. Y.	5.675 R3,B3	5.675 R3,B3	7.70 B5	6.725 B3,R3	9.025 B3,B5	8.30 B3	5.30 B3				8.00 W6
	Claymont, Del.							5.30 C4		7.50 C4	7.95 C4	
	Coatesville, Pa.							5.30 L4		7.50 L4	7.95 L4	
	Consabohocken, Pa.							5.30 A2	6.375 A2	7.50 A2	7.95 A2	
	Harrisburg, Pa.							5.30 P2	6.475 P2			
	Milton, Pa.	5.825 M7	5.825 M7									
	Hartford, Conn.			8.15 R3		9.325 R3						
	Johnstown, Pa.	5.675 B3	5.675 B3		6.725 B3		8.30 B3	5.30 B3		7.50 B3	7.95 B3	8.00 B3
	Fairless, Pa.	5.825 U1	5.825 U1		6.875 U1							
	Newark, Camden, N. J.			8.10 W10, P10		9.20 W10, P10						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 W10 8.15 J3	6.80 N8	9.175 N8						
	Sparrows Pt., Md.		5.675 B3					5.30 B3		7.50 B3	7.95 B3	8.10 B3
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 B5, C14		9.325 A5,B5						8.30 A5, W6
	Spring City, Pa.			8.10 K4		9.20 K4						
MIDDLE WEST	Alton, Ill.	5.875 L1										8.20 L1
	Ashland, Newport, Ky.							5.30 A7, A9		7.50 A9	7.95 A7	
	Canton, Massillon, Mansfield, Ohio	6.15* R3		7.65 R3,R2	6.725 R3 6.475 T5	9.025 R3,R2 8.775 T5		5.30 E2				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 U1,R3, W8,N4,P13	5.675 U1,R3, N4,P13,W8 5.875 L1	7.65 A5, W10,W8, B5,L2,N9	6.725 U1,R3, W8	9.025 A5, W10,W8, L2,N8,B5	8.30 U1,W8, R3	5.30 U1,A1, W8,I3	6.375 U1	7.50 U1, W8	7.95 U1, W8	8.00 A5,R3, W8,N4, K2,W7
	Cleveland, Ohio Elyria, Ohio	5.675 R3	5.675 R3	7.65 A5,C13, C18		9.025 A5, C13,C18	8.30 R3	5.30 R3,J3	6.375 J3		7.95 R3,J3	8.00 A5, C13,C18
	Detroit, Mich.	5.675 G3	5.675 G3	7.90 P3 7.85 P8,B5 7.65 R5	6.725 R5,G3	9.025 R5 9.225 B5,P3, P8	8.30 G3	5.30 G3		7.50 G3	7.95 G3	
	Duluth, Minn.											8.00 A5
	Gary, Ind. Harbor, Crawfordville, Hammond, Ind.	5.675 U1,I3, Y1	5.675 U1,I3, Y1	7.65 R3,J3	6.725 U1,I3, Y1	9.025 R3,M4	8.30 U1,Y1	5.30 U1,I3, Y1	6.375 J3, I1	7.50 U1, Y1	7.95 U1, Y1,I3	8.10 M4
	Granite City, Ill.							5.40 G2				
	Kokomo, Ind.		5.775 C9									8.10 C9
	Sterling, Ill.	5.775 N4	5.775 N4					5.30 N4				8.10 K2
	Niles, Warren, Ohio Sharon, Pa.			7.65 C10	6.725 C10	9.025 C10		5.30 R3,S1		7.50 S1	7.95 R3, S1	
	Owensboro, Ky.	5.675 G5			6.725 G5							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 U1,J3	5.675 U1,J3	7.65 A5,B4, R3,J3,C11, W10,S9,C8, M9	6.725 U1,J3, C11,B7	9.025 A5, W10,R3,S9, C11,C8,M9	8.30 U1,J3	5.30 U1,J3	6.375 U1,J3	7.50 U1, J3,B7	7.95 U1, J3,B7	8.00 A5, J3,P6
WEST	Portsmouth, Ohio											8.00 P7
	Weirton, Wheeling, Follansbee, W. Va.							5.30 W5				
	Youngstown, Ohio	5.675 U1,R3, Y1	5.675 U1,R3, Y1	7.65 A1,Y1, F2	6.725 U1,Y1	9.025 Y1,F2	8.30 U1,Y1	5.30 U1, R3,Y1		7.50 Y1	7.95 U1,Y1	8.00 Y1
	Emeryville, Cal.	6.425 J5	6.425 J5		7.775 K1		9.00 K1	6.10 K1		8.30 K1	8.75 K1	
	Fontana, Cal.	6.375 K1	6.375 K1									
	Geneva, Utah							5.30 C7			7.95 C7	
	Kansas City, Mo.	5.925 S2	5.925 S2		6.975 S2		8.55 S2					8.25 S2
	Los Angeles, Torrance, Cal.	6.375 C7,B2	6.375 C7,B2	9.10 R3,P14, S12	7.775 B2	11.00 P14, S12	8.625 B2					8.95 B2
	Minnequa, Colo.	6.125 C6	6.125 C6					6.15 C6				8.25 C6
	Portland, Ore.	6.425 O2	6.425 O2									
SOUTH	San Francisco, Niles, Pittsburg, Cal.	6.375 C7 6.425 B2	6.375 C7 6.425 B2				8.675 B2					8.95 C7,C6
	Seattle, Wash.	6.425 B2,N6	6.425 B2				8.675 B2	6.20 B2		8.40 B2	8.85 B2	
	Atlanta, Ga.	5.875 A8	5.675 A8									8.00 A8
	Fairfield City, Ala. Birmingham, Ala.	5.675 T2,R3, C16	5.675 T2,R3, C16	8.25 C16			8.30 T2	5.30 T2,R3			7.95 T2	8.00 T2,R3
	Houston, Ft. Worth, Lone Star, Texas	5.925 S2	5.925 S2		6.975 S2		8.55 S2	5.40 S2		7.60 S2	8.05 S2	8.25 S2

† Merchant Quality—Special Quality 35¢ higher.

(Effective Jan. 19, 1959)

* Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1	Acme Steel Co., Chicago
A2	Alan Wood Steel Co., Conshohocken, Pa.
A3	Allegheny Ludlum Steel Corp., Pittsburgh
A4	American Cladmetals Co., Carnegie, Pa.
A5	American Steel & Wire Div., Cleveland
A6	Angel Nail & Chaplet Co., Cleveland
A7	Armco Steel Corp., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A9	Acme-Newport Steel Co., Newport, Ky.
B1	Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2	Bethlehem Pacific Coast Steel Corp., San Francisco
B3	Bethlehem Steel Co., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin, Inc., Harvey, Ill.
B6	Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7	A. M. Byers, Pittsburgh
B8	Braeburn Alloy Steel Corp., Braeburn, Pa.
C1	Calstrip Steel Corp., Los Angeles
C2	Carpenter Steel Co., Reading, Pa.
C4	Claymont Products Dept., Claymont, Del.
C6	Colorado Fuel & Iron Corp., Denver
C7	Columbia Geneva Steel Div., San Francisco
C8	Columbia Steel & Shifting Co., Pittsburgh
C9	Continental Steel Corp., Kokomo, Ind.
C10	Copperweld Steel Co., Pittsburgh, Pa.
C11	Crucible Steel Co. of America, Pittsburgh
C13	Cuyahoga Steel & Wire Co., Cleveland
C14	Compressed Steel Shifting Co., Readville, Mass.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Conners Steel Div., Birmingham
C18	Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
D1	Detroit Steel Corp., Detroit
D2	Driver Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
D4	Dickson Weatherproof Nail Co., Evanston, Ill.
E1	Eastern Stainless Steel Corp., Baltimore
E2	Empire-Reeves Steel Corp., Mansfield, O.
E3	Enamel Products & Plating Co., McKeesport, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
F2	Fitzsimons Steel Corp., Youngstown
F3	Follansbee Steel Corp., Follansbee, W. Va.

G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Corp., Detroit
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owensboro, Ky.
H1	Hanna Furnace Corp., Detroit
I2	Ingersoll Steel Div., Chicago
I3	Inland Steel Co., Chicago
I4	Interlake Iron Corp., Cleveland
J1	Jackson Iron & Steel Co., Jackson, O.
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K1	Kaiser Steel Corp., Fontana, Calif.
K2	Keystone Steel & Wire Co., Peoria
K3	Koppers Co., Granite City, Ill.
K4	Keystone Drawn Steel Co., Spring City, Pa.
L1	Laclede Steel Co., St. Louis
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
M1	Mahoning Valley Steel Co., Niles, O.
M2	McLouth Steel Corp., Detroit
M3	Merced Tube & Mfg. Co., Sharon, Pa.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M6	Mystic Iron Works, Everett, Mass.
M7	Milton Steel Products Div., Milton, Pa.
M8	Mill Strip Products Co., Evanston, Ill.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
N1	National Supply Co., Pittsburgh
N2	National Tube Div., Pittsburgh
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle
N7	Newman Crosby Steel Co., Pawtucket, R. I.
N8	Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9	Nelson Steel & Wire Co.
O1	Oliver Iron & Steel Co., Pittsburgh
O2	Oregon Steel Mills, Portland
P1	Page Steel & Wire Div., Monessen, Pa.
P2	Phoenix Iron & Steel Co., Phoenixville, Pa.
P3	Pilgrim Drawn Steel Div., Plymouth, Mich.
P4	Pittsburgh Coke & Chemical Co., Pittsburgh
P5	Pittsburgh Screw & Bolt Co., Pittsburgh
P6	Pittsburgh Steel Co., Pittsburgh
P7	Portsmouth Div., Detroit Steel Corp., Detroit

P8	Plymouth Steel Co., Detroit
P9	Pacific States Steel Co., Niles, Cal.
P10	Precision Drawn Steel Co., Camden, N. J.
P11	Production Steel Strip Corp., Detroit
P13	Phoenix Mfg. Co., Joliet, Ill.
P14	Pacific Tube Co.
P15	Philadelphia Steel and Wire Corp.
R2	Reliance Div., Eaton Mfg. Co., Massillon, O.
R3	Republic Steel Corp., Cleveland
R4	Roebbing Sons Co., John A. Trenton, N. J.
R5	Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S2	Sheffield Steel Div., Kansas City
S3	Shenango Furnace Co., Pittsburgh
S4	Simonds Saw and Steel Co., Fitchburg, Mass.
S5	Sweet's Steel Co., Williamsport, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S9	Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10	Seneca Steel Service, Buffalo
S11	Southern Electric Steel Co., Birmingham
S12	Sierra Drawn Steel Corp., Los Angeles, Calif.
T1	Tonawanda Iron Div., N. Tonawanda, N. Y.
T2	Tennessee Coal & Iron Div., Fairfield
T3	Tennessee Products & Chem. Corp., Nashville
T4	Thomas Strip Div., Warren, O.
T5	Timken Steel & Tube Div., Canton, O.
T7	Texas Steel Co., Fort Worth
T8	Thompson Wire Co., Boston
U1	United States Steel Corp., Pittsburgh
U2	Universal Cyclops Steel Corp., Bridgeville, Pa.
U3	Ulbrich Stainless Steels, Wallingford, Conn.
U4	U. S. Pipe & Foundry Co., Birmingham
W1	Wallingford Steel Co., Wallingford, Conn.
W2	Washington Steel Corp., Washington, Pa.
W3	Weirton Steel Co., Weirton, W. Va.
W4	Wheatland Tube Co., Wheatland, Pa.
W5	Wheeling Steel Corp., Wheeling, W. Va.
W6	Wickwire Spencer Steel Div., Buffalo
W7	Wilson Steel & Wire Co., Chicago
W8	Wisconsin Steel Div., S. Chicago, Ill.
W9	Woodward Iron Co., Woodward, Ala.
W10	Wyckoff Steel Co., Pittsburgh
W12	Wallace Barnes Steel Div., Bristol, Conn.
Y1	Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about \$200 per net ton.

STANDARD T. & C.	BUTTWELD												SEAMLESS							
	1/4 In.		3/8 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2 In.		3 In.		3 1/2 In.		4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. B3.....	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50						
Youngstown R3.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50						
Fontana K1.....	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50						
Pittsburgh J3.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0
Alton, Ill. L1.....	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50						
Sharon M3.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50						
Fairless N2.....	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50						
Pittsburgh N1.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0
Wheeling W5.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50						
Wheatland W4.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50						
Youngstown Y1.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0
Indiana Harbor Y1.....	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50						
Lorain N2.....	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. B3.....	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50						
Youngstown R3.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50						
Fairless N2.....	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50						
Fontana K1.....	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75							
Pittsburgh J3.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50
Alton, Ill. L1.....	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50						
Sharon M3.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50						
Pittsburgh N1.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50
Wheeling W5.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50						
Wheatland W4.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50						
Youngstown Y1.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50
Indiana Harbor Y1.....	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50						
Lorain N2.....	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50

Threads only, butt-weld and seamless, 2 1/4 pt. higher discount. Plain ends, butt-weld and seamless, 3-in. and under, 5 1/2 pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/4, 3/8 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11 5/8¢ per lb.

(Effective Jan. 19, 1959)

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders

Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.25
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00
Welding Powders*	8.10
Cutting and Scarfing Powders*	9.10

Copper Powders

Electrolytic, domestic	41.00
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	\$5.00
Lead	19.00
Manganese, f.o.b.	42.00
Molybdenum	\$3.60 to \$3.95
Nickel	\$1.05 to \$1.03
Nickel Silver	53.50
Nickel Steel	13.00
Solder	13¢ plus metal value
Stainless Steel, 302	\$1.07
Stainless Steel, 316	\$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb.	
f.o.b.	\$11.25
Tungsten	\$3.15 (nominal)

* F.O.B., shipping point.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Bolts	1-4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine				
1/2" and smaller x 3" and shorter	55	57	61	62
5/8" diam. x 3" and shorter	47	49 1/2	54	55
3/4" thru 1" diam x 6" and shorter	37	39 1/2	45	46
3/4" thru 1" diam. longer than 6" and 1 1/4" and larger x all lengths	31	34	40	41
Roller thread, 1/2" and smaller x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts 1/2" and smaller x 6" and shorter	48	50 1/2	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

Nuts, Hex, HP reg. & hvy.

	Full case or Keg price
3/4" in. or smaller	62
3/4" in. to 1 1/4" in. inclusive	56
1 1/4" in. and larger	51 1/2

C. P. Hex, reg. & hvy.

3/4" in. or smaller	62
3/4" in. to 1 1/4" in. inclusive	56
1 1/4" in. and larger	51 1/2

Hot Galv. Hex Nuts (All Types)

3/4" in. and smaller	41
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Semi-finished Hex Nuts

3/4" in. or smaller	62
3/4" in. to 1 1/4" in. inclusive	56
1 1/4" in. and larger	51 1/2

(Add 25 pct for broken case or keg quantities)

Finished

3/4" in. and smaller	65
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Rivets

	Base per 100 lb
1/2" in. and larger	\$12.85
7/16 in. and smaller	Pct. Off List 15

Cap Screws

	Discount (Packages)
Full Finished H. C. Heat Treat	
New std. hex head, packaged	Full Case

3/4" diam. and smaller x 6" and shorter	54	42
3/4", 7/8", and 1" diam. x 6" and shorter	38	23
3/4" diam. and smaller x longer than 6"
3/4", 7/8", and 1" diam. x longer than 6"
1/4" through 5/8" dia. x 6" and shorter	59	48
3/4" through 1" dia. x 6" and shorter	45	32
Minimum quantity—1/4" through 3/8" diam., 15,000 pieces; 7/16" through 5/8" diam., 5,000 pieces; 3/4" through 1" diam., 2,000 pieces.		

Machine Screws & Stove Bolts

	Discount	
	Mach. Screws	Stove Bolts
Plain Finish		
Cartons	60	60
Bulk		
Quantity		
To 1/4" incl.	25,000-and over	60
5/16 to 1/2" diam. incl.	15,000-200,000	60

Machine Screws & Stove Bolt Nuts

	Discount	
	Hex	Square
In Cartons	16	19
Quantity		
In Bulk		
3/4" diam. & smaller	25,000-and over	15

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities		Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
	City Delivery & Charge	Hot-Rolled (10 ga. & hvy.)	Cold-Rolled (15 gage)	Galvanized (10 gage)†	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold- Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24*				
Baltimore	\$10	8.65	9.35	9.09	9.15	9.10	9.65	9.55	11.80*	16.28	15.28	19.82	19.08
Birmingham		8.18	9.45	10.46	8.51	8.89	9.00	8.99					
Boston	10	9.41	10.50	12.07	9.84	10.12	10.11	10.21	13.45*	16.79	15.79	20.29	19.56
Buffalo	15	8.40	9.75	11.00	8.90	9.35	9.40	9.30	11.60*	16.34	15.55	19.01	19.30
Chicago	15	8.40	9.60	11.05	8.66	9.04	9.15	9.14	9.30	16.20	15.20	19.70	18.95
Cincinnati	15	8.58	9.65	10.70	8.98	9.42	9.71	9.46	11.68*	16.52	15.52	20.02	19.27
Cleveland	15	8.51	9.69	11.51	8.78	9.28	9.54	9.25	11.40*	16.31	15.31	19.81	19.06
Denver	20	9.60	11.84	12.94	9.43	9.96	10.04	10.00	11.19				20.84
Detroit	15	8.66	9.85	11.40	9.03	9.41	9.71	9.45	9.66	15.46	15.46	18.81	19.23
Houston		8.10	8.60		8.15	8.45	8.05	8.10	11.60	16.20	15.25	19.65	18.95
Kansas City	15	9.02	10.27	11.37	9.33	9.71	9.82	9.91	10.22	16.87	15.87	20.37	19.62
Los Angeles		8.70*	11.20	12.20	9.15	9.10	9.00	9.10	12.95	17.30	16.35	21.30	20.60
Memphis	15	8.55	9.80		8.60	8.93	9.01	8.97	12.11*				
Milwaukee	15	8.54	9.73	11.19	8.80	9.18	9.37	9.28	9.54	16.34	15.34	19.84	19.09
New York	10	8.97	10.23	11.20	9.74	9.87	9.84	10.09	13.35*	16.16	15.60	20.10	19.35
Norfolk	20	8.20			8.90	8.65	9.20	8.90	10.70				
Philadelphia	10	8.30	9.35	10.44	9.35	9.25	9.20	9.50	12.05*	16.58	15.58	20.08	19.33
Pittsburgh	15	8.50	9.70	11.05	8.76	9.05	9.15	9.14	11.40*	16.20	15.20	19.70	18.95
Portland		8.60	9.95										
Portland		10.00†	11.75†	13.30†	11.95*	11.50*	11.10*	9.85*	15.30*	18.50	17.45	20.75	20.25
San Francisco	10	9.75	11.20	11.50	9.85	10.10	9.95	10.25	13.70	17.05	16.35	21.05	20.60
Seattle		9.95	11.55	12.45	10.00	9.70	9.80	10.10	14.70	17.15	16.80	20.65	20.60
Spokane	15	10.10	11.70	12.60	10.65	9.85	9.95	10.75	14.85	17.75	16.95	21.55	20.75
St. Louis	15	8.78	9.98	11.43	9.04	9.42	9.63	9.52	9.93	16.58	15.58	20.08	19.33
St. Paul	15	8.94	10.19	11.64	8.99	9.45	9.53	9.70†	10.16		15.41		19.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **All sizes except 18 and 16 gage.

† 10¢ zinc. ‡ Deduct for country delivery. * C1018—1 in. rounds, 1 10 ga. x 36" x 120"; 20 ga. x 86" x 120"; 26 ga. x 30" x 96"; 4 1/2" x 1" in lots of 1000 to 9999; sheared plate 1/4" x 84" in lots of 1000 to 9999; 8" x 8.70" in lots of 1000 to 9999; M-1020—1-in. rounds in lots of 1000 to 9999; 16 ga. & heavier.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Pittsburgh, Pa. B6	68.00	68.50	69.00	69.50	
Birmingham R3	62.00	62.50	63.00	63.50	
Birmingham W9	62.00	62.50	63.00	63.50	
Birmingham U4	62.00	62.50	63.00	63.50	
Buffalo R3	66.00	66.50	67.00	67.50	
Buffalo H1	66.00	66.50	67.00	67.50	
Buffalo H6	66.00	66.50	67.00	67.50	
Chester P2	66.50	67.00	67.50	68.00	
Chicago I4	66.00	66.50	67.00	67.50	
Cleveland A5	66.00	66.50	67.00	67.50	71.00
Cleveland R3	66.00	66.50	67.00	67.50	
Duluth I4	66.00	66.50	67.00	67.50	71.00
Erie I4	66.00	66.50	67.00	67.50	71.00
Everett M6	67.50	68.00	68.50	69.00	
Fontana K1	75.00	75.50	76.00	76.50	
Geneva, Utah C7	66.00	66.50	67.00	67.50	
Granite City G2	67.90	68.40	68.90	69.40	
Hubbard Y1	66.00	66.50	67.00	67.50	
Ironton, Utah C7	66.00	66.50	67.00	67.50	
Midland C11	66.00	66.50	67.00	67.50	
Minnequa C6	68.00	68.50	69.00	69.50	
Monesen P6	66.00	66.50	67.00	67.50	
Neville Is. P4	66.00	66.50	67.00	67.50	71.00
N. Tonawanda T1	66.00	66.50	67.00	67.50	
Sharpsville S3	66.00	66.50	67.00	67.50	
So. Chicago R3	66.00	66.50	67.00	67.50	
So. Chicago W8	66.00	66.50	67.00	67.50	
Swedeland A2	68.00	68.50	69.00	69.50	
Toledo I4	66.00	66.50	67.00	67.50	
Troy, N. Y. R1	68.00	68.50	69.00	69.50	73.00
Youngstown Y1	66.00	66.50	67.00	67.50	

DIFFERENTIALS: Add 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, \$2 per ton for 0.50 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Add \$1.00 for 0.31 to 0.69 pct phosphorus.

Silver Iron: Buffalo (6 pct), H1, \$79.25; Jackson J1, I4, Globe Div., \$78.00; Niagara Falls (15.01 to 15.50), \$101.00; Keokuk (14.01 to 14.50), \$103.50; (15.51 to 16.00), \$106.50. Add \$1.30 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add \$1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under 10 pct phos.) to \$64.00. Add \$1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingot, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2; Baltimore, Md.; Middletown, O., A7; Massillon, O., R3; Gary, Ind., U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Detroit, Mich.; Louisville, O., R5.

Strip: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leeburg, Pa., A3; Bridgeville, Pa., U2; Detroit, Mich.; Canton, Massillon, O., R3; Harrison, N. J., D3; Youngstown, Pa., S1; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (plus further conversion extras); W1 (25¢ per lb. higher); New Bedford, Mass., R6; Gary, Ind. (25¢ per lb. higher).


Bar: Baltimore, Md.; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, Ind.; Newark, N. J., D2; Harrison, N. J., D3; Baltimore, Md.; Dunkirk, A3; Monessen, Pa.; Syracuse, N. Y.; Bridgeville, U2; Detroit, Mich.

Structurals: Baltimore, Md.; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, N. Y.; S. Chicago, Ill.

Plates: Baltimore, Md.; Brackenridge, Pa., A3; Chicago, Ill.; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, Md.; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C13; Vandergrift, Pa., U1; Gary, Ind.

Forging billets: Midland, Pa., C11; Baltimore, Md.; Washington, Pa., J2; McKeesport, Pa., F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, Ill.; Syracuse, N. Y.; Detroit, Mich.; Munhall, Pa., S. Chicago, Ill.; Owensboro, Ky., G3; Bridgeport, Conn., N8.

(Effective Jan. 19, 1959)



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 ALLOY STEEL 150,000 LBS. TENSILE STRENGTH
 T-Bolts—½", ¾", 1", 1½", 2" Body Diameters
 Bolster Bolts to J.I.C. Standards

Special bolts available to 1½" body diameter and 3" Square Head. All bolts except ½" and ¾" available with Hexagon Heads... Hardened Nuts and Ground Washers available for all size bolts.

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 DIVISION OF CHANNING CORPORATION

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.			
0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25
4.00-4.50% C, 60-70% Cr, 1-2% Si.			28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si.			28.25
0.025% C (Simplex)			36.75
8% max C, 50-55% Cr, 6% max Si.			25.75
4 1/2% max C, 50-55% Cr, 2% max Si.			26.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.	
0.10% max. C	\$1.29
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (1/4" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.	
Carloads	\$1.15
Ton lots	1.17
Less ton lots	1.19

Low Carbon Ferrochrome Silicon

(Cr 29-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.			
Price is sum of contained Cr and contained Si.			
	Cr	Si	
Carloads, bulk	28.25	14.60	
Ton lots	33.50	16.05	
Less ton lots	35.10	17.70	

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.	
Carloads, bulk	24.00
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese-Silicon

Cents per lb of alloy, lump, delivered, packed. 16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads, bulk	23.00
Ton lots	26.15
Less ton lots	27.15

5M2

Cents per pound of alloy, delivered, 60-65% Si, 6-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 12 mesh.	
Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.	
Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, 66 pct Mn:	
Carloads, bulk	14.80
Ton lots packed in bags	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.	
Manganese Silicon	
16 to 19% 3% max.	\$100.50
19 to 21% 3% max.	102.50
21 to 23% 3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	45.75
Carload, packed	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn	
	25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.			
	Carloads	Ton	Less
0.07% max. C, 0.06% (Bulk)			
P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.	
Carloads bulk	12.30
Ton lots, packed	14.45
Carloads, bulk, delivered, per lb of briquet	15.10
Briquets, packed pallets, 3000 lb up to carloads	16.30

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.	
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Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.		
	Ton lots	Carloads
98.25% Si, 0.50% Fe.	24.95	23.65
98% Si, 1.0% Fe.	24.45	23.15

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.	
Carloads, bulk	8.00
Ton lots, packed	10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.			
50% Si....	14.60	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
	90% Si....		20.00

Ferrovandium

50-55% V delivered, per pound, contained V, in any quantity.	
Openhearth	3.20
Crucible	3.30
High speed steel	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.		
	Cast	Turnings Distilled
Ton lots	\$2.05	\$2.95
100 to 1999 lb.	2.40	3.30
		4.55

(Effective Jan. 19, 1959)

Alsiifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk	9.85¢
Ton lots	11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo

	\$1.50
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Ferrocolumbium, 50-60% lb, 2 in. x D, delivered per pound contained Cb.

Ton lots	\$3.90
Less ton lots	3.85

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb cont'd Cb plus Ta

	\$3.40
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Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.

	\$1.76
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Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$5.00 unitage, per gross ton

10 tons to less carload	\$120.00
	\$131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti

	\$1.35
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Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti

	\$1.50
Less ton lots	\$1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton

	\$240.00
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Ferrotungsten, 1/4 x down packed, per pounds contained W, ton lots delivered

	\$2.15 (nominal)
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Molybdenic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa.

bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.49
	\$1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V₂O₅ per pound contained V₂O₅

	\$1.38
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Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk.. 12-15%, del'd lump, bulk-carloads

	\$26.25¢
	\$9.25¢

Boron Agents

Borasil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload	\$5.50
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Bortram, f.o.b. Niagara Falls. Ton lots per pound

	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	14.00¢
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Ferroboreon, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.

F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up	
10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Cambridge, O., freight allowed, 100 lb and over

No. 1	\$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots (packed)	\$1.46
Less ton lots (packed)	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots

	2.15
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ELECTRICAL POWER EQUIPMENT IN STOCK DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	4900	New Elliott	Enc. F.V.	475	330
1	3000	New Whse.	Enc. F.V.	525	600
1	2250	New Elliott	Enc. F.V.	600	200/300
1	2200	G.E.	MCF	600	400/500
1	1750	New Elliott	Enc. F.V.	250	175/350
8	1500	New Whse.	Enc. F.V.	525	600
1	1300	G.E.	MCF-12	300	250/400
1	1200	G.E.	MCF	600	450/600
1	1000	Whse.		500	800/2000
1	940	Whse.	QM	250	140/170
2	940	S.B.	Enc. F.V.	600	800/1000
2	900	G.E.	MCF	250	400/750
2	765	Allis Ch.	MHC	550	1012/1350
2	750	G.E.	MCF	600	450/900
1	750	G.E.	MCF	600	300/720
1	750	G.E.	MCF	600	150/360
2	645	S.B.	Enc. F.V.	300	1000
4	600	Whse.		250	275/550
1	500	G.E.B.B.	TLF-2050H	250	2000/3600
1	500	G.E.	MPC-10	250	188/400
1	450	Whse.		350	415
2	400	G.E.	CY-275	300	1000/1500
3	325	Allis Ch.	MHC	250	450/900
1	300	Cr Wh.	H-102 R.B.	230	1200
2	275	G.E.B.B.	TLC-104	250	2000/4000
1	250	G.E.B.B.		250	1150/3600
1	200	Rel. B.B.	T-464-D.P.	240	850
1	200	Whse.	CB-207-4	250	850/1200
1	150	Cr Wh.	CMC-65H	230	1150
1	150	G.E.B.B.	TLC-74	250	1150/3500
1	150	G.E.B.B.	CD	600	250/750
1	120	G.E.B.B.	TLC-50	250	1950/5000
1	125/150	New Whse.	CB-210.3	230	300/1200
1	120	Rel. B.B.	1050T	230	575/900
2	125	Whse.	SK-190	230	450/1300
1	125	Whse.	SK-185	230	350/1050
1	100	G.E.	CDP-145	230	1750
1	80	Whse.	SK-123.9	240	2000/4500
1	75	G.E.B.B.	CD-1235-D.P.	600	850
1	60/75	Rel. B.B.	T-464-D.P.	240	300/1300
1	50	G.E.	CD-1126	250	600/1050
1	40	Rel. B.B.	TY-663	240	300/1200
1	30/40	Whse. B.B.	SK-131, TEFC	250	500/1500

MERCURY ARC RECTIFIERS

3-150 KW. G.E. Sealed Tube Ignitron Unit Substation load centers 275 V. D.C., 2300 V. A.C. Pyranol filled transformers complete.

2-150 KW. G.E. Ignitron, 245 V. D.C.—230 V. A.C., air cooler transformers with controls.

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
1	2000	G.E.	514	600	2300/4600
2	1750/2100	G.E.	514	250/300	2300/4600
1	1750	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1500	G.E.	650	600	11000/6600
1	1500	S.S. 3 unit	720	600	11000/6600
1	1500	Cr. Wh.	720	100	2300
2	1000	G.E.	720	600	6000/13200
2	750	G.E.	720	250/300	6600/13200
1	500	G.E.	900	125/250	440
1	350	G.E.	900	125	410/2300/4160
1	300	G.E.	1200	250	2300/4000
1	300	G.E.	1200	250	440/2300
1	250	G.E.	900	250	410/2300
1	240	Whse.	900	125	230/440
1	200	Whse.	1200	550	2300
1	200	Fl. Mhy.	1200	250	2300/4600
1	150	G.E.	1200	275	2300
1	150	Whse.	1200	275	2300
1	150	G.E.	1200	125	440
1	140	Cr. Wh.	690	125/250	2300
1	100	G.E.	1170	250	220/440
1	100	Cr. Wh.	1800	440	440
2	100	Cr. Wh.	1160	525	220/550
1	100	G.E.	1200	250	2400/4100
2	75	Whse.	1200	125	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
2	3333	Whse.	OTSC	1	13360/2300
1	1500	G.E. auto	HT	3	4000/4200/4400
1	1000	G.E.	OA/FA	1	13800 x 250/480
2	750	G.E.	Pyranol	1	4800x85/55-255/165
2	500	Kuhl	OTSC	1	13200 x 6600
3	3333	G.E.	HS-W4R	1	2400/4160/240 x 480
3	333	G.E.	OTSC	3	2400/4160V x 600
3	150	G.E.	OTSC	1	3300x2300/4000V
3	100	G.E.	HS	1	480/8320/120/240
1	50	Mol.	OTSC	3	13200 x 240-480
3	100	L.M.	LA	1	4160/7500-240/480

CRANE & MILL MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
14	12/14	Whse.	700/600	MCA-30, Series	
1	20	Whse.	975	K-5 Series	
2	25	G.E.	850	MDR-408	
2	25	G.E.	725	CO-1808, Series	
1	35	Whse.	480	CK-9 Comm. S.B.	
1	35	Whse.	480	CK-9 Sh. R.B.	
1	45	Whse.	600	CK-9 Comm. S.B.	
3	50	G.E.	850	COM-1830 Comp.	
8	50	Whse.	525	CK-9 Shunt R.B.	
2	50	Whse.	600	CK-9 Comm. R.B.	
1	50	Whse.	525	COM-1830A2B.B	
1	50	Cr. Wh.	550	SW-50 Comm.	
1	100	G.E.	475	CO-1832 S.B.	
6	100/140	Whse.	580/415	MC-90 R.B.	

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THE CLEARING HOUSE

Budget Caution Hurts New York Market

Used machinery dealers there say inquiries are good and the sales outlook promising.

But many buyers are still reluctant to approve capital spending requests.

■ "Like an elevator. Up and down every day." That's the way a leading dealer describes the used and rebuilt machinery business in the New York area. But he believes the ups are the better barometer of future sales.

Area dealers point out there is a sturdy business potential. Inquiries continue to come in at a good clip, and some recent sales closed negotiations started 3 or 4 months ago.

Money Problems—Biggest drawback at present is budgets. Many prospects freely admit the need for machines, regretfully add their front offices have not given them the money—yet. Many concerns have simply deferred all capital appropriations until they are really convinced of the business upturn. Others are feeling their way along from month to month.

Busier Than Others—Exceptions to this cautious trend are office equipment makers and structural steel fabricating shops. The office equipment companies are doing fairly brisk buying of special-purpose tools, particularly drilling machines.

Construction shops continue to be a robust market for fabricating equipment of all types. Demand for this kind of machinery seems to have become almost a regular fea-

ture in the New York market. One dealer explains it this way:

Most of these fabricating shops are relatively small operations. The orders they get are usually too small and short-run to justify buying new equipment. Since their own lead time is short, the shops must have what tools they do buy quickly. The used and rebuilt market, with low prices and spot delivery, is the fabricating shops' natural shopping center.

More Pipe Work—A special feature of the New York market is the pipeline business. There has been a sharp spurt in tool orders from pipe fabricators ever since the Supreme Court reversal of the Memphis decision.

While there are real bright spots in today's market, it is still far from a boom. Dealers have great expectations; but are increasingly aware that the New Year did not usher in a brand new business boost. An upturn in the first or second quarter seems definite, but it won't come overnight.

Auction On the Way

Equipment in the machine tool manufacturing department of the Hanson Whitney Div. of Whitney Chain Co. goes on sale Jan. 27. The plant is located on Bartholomew Ave. in Hartford, Conn.

Auction will be managed by the Industrial Plants Corp. Machinery up for sale includes planers, turret lathes, shapers, horizontal boring mills, milling machines, and grinders.

CONSIDER GOOD USED EQUIPMENT FIRST

BALERS

P-133 Logemann, Box Size 60" x 22" x 18 1/2"
P-115 Logemann, Box Size 100" x 48" x 21"

BENDING ROLLS

12' x 5/8" Billes & Jones Pyramid Type
32' x 5/8" BALDWIN PYRAMID TYPE—LATE

BRAKE—PRESS TYPE

12' x 5/8" Airtherm Model No. 3814

BUILDINGS

50' x 325' x 24' Under Span
70' x 760' x 39' Under Span

CRANES—OVERHEAD ELECTRIC TRAVELING

7 1/2 ton P&H 60' Span 230 Volt D.C.
8 ton P&H 55' Span 230/3/60
10 ton P&H 50' Span 230 Volt D.C.
10 ton P&H 39' Span 230 Volt D.C.
10 ton Milwaukee 57' Span 230 Volt D.C.
10 ton Shaw 48' Span 230 Volt D.C.
10 ton Whiting 75' Span 220/3/60 A.C.
10 ton Shaw 120' Span 230 Volt D.C.
15 ton P&H 50' Span 230 Volt D.C.
15 ton Shepard Niles 50' Span 230 Volt D.C.
15 ton N-B-P 100' Span 230/3/60 A.C.
120 ton Shepard Niles 77' Span 230/3/60

DIEING MACHINE

50 ton Henry & Wright, 4 1/2" Stroke

DRAW BENCHES

10,000 lb. Draw Bench, 50 ft. Draw
35,000 lb. Draw Bench, 41 ft. Draw
50,000 lb. Draw Bench, 20 ft. Draw

FORGING MACHINES

1" to 5" Acme, Ajax, National

GEAR REDUCERS

3000 H.P. United (2), Ratio 16.2-1 & 11.6-1

HAMMERS—BOARD DROP—STEAM DROP—STEAM

FORGING 800 lb. to 12,000 lb. incl.

LEVELERS—ROLLER

54" McKay 17 Rolls 4 1/2" dia.
60" McKay 17 Rolls 3 1/2" dia.
72" McKay 15 Rolls 4 1/2" dia.

POLISHER

Mattison #464 Polisher for 24" wide strip

PRESS—EMBOSSING & COINING

#664 Toledo 600 ton, 2" Stroke

PRESSES—HYDRAULIC

300 ton Southward, Bed 28" x 28", Stroke 25"
500 ton Watson Stillman Piercing Press 48" x 72"
500 ton HPM Fastraverse, Bed 36" x 36"
1000 ton HPM Fastraverse, Bed 48" x 72", 30" Stroke
1500 ton H-L-H Bed 68 x 68", Stroke 40"

PUNCH—BEAM

#14 Thomas Guillotine Type 225 ton Capy.
With 50 ft. Spacing Tables

PUNCH & SHEAR COMBINATIONS

#1 1/2 Buffalo Universal Ironworker
BF Cleveland, 60" Throat

ROLL—CORRUGATING

#3 Siamco, 24" Dia. Rolls, For Sheets 144"x40"

ROLLING MILLS

6" x 5" Torrington Flat Wire Mill Line
2 1/2" x 9" x 9" 4-High Strip Mill
3 1/2" x 7" Six Roll Cluster Mill
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Two Stand Two High
20" x 36" Single Stand Two High

ROLLS—FORMING

6 Stand Dahlstrom #450-6 for stock to 4 1/2" wide
18 Stand Custom Built, 2 1/2" Shaft, will take 36" wide

ROLLS—PLATE STRAIGHTENERS

100 Bertach Seven Rolls 9" Dia.

72" Niles 7 Rolls 9" Dia. Motor Driven

SHEARS—ALLIGATOR

#3 1/2 Lewis All Steel, Capy. 4" Rd., 3 1/2" Sq.

#4 Mesta Cast Steel, Capy. 2" x 12" Cold

SHEAR LINE

Cleveland Cut Off Machine, Leveler, Coil Cradle

Handles steel sheets 48" wide up to 1/16" thick

SHEARS—SQUARING

6" x 14 Ga. Edwards, Motor Drive—LATE

10' x 1 1/2" Cincinnati

10' x 3/4" Niagara

SLITTER

36" Yoder, 4 1/2" Dia. Airbr

STRAIGHTENERS

Torrington #1734 12-Roll, Capy. 1 1/2" Rd. 1-9/16"

5/8" Shuster Straightener, 12 Ft. Cut Off

SWAGING MACHINES

#4 Torrington 2-Die, Capy. 2" Tube, 5/8" Solid
#6A Penn. Capy. 3 1/2" Tube, 1 1/2" Solid, 10" Die
Length. With Hydraulic Feed

TESTING MACHINES

20,000 lb. Baldwin Univ. Hydraulic

50,000 lb. Baldwin Southward Compression

100,000 lb. Olsen Universal Beam Type

500,000 lb. Olsen Super DeLuxe Compression

TUBE REDUCERS

1 1/2" Tube Reducer for steel

2 1/2" Tube Reducer for aluminum

WIRE DRAWING MACHINES

Type B Morgan 4-Block Capy. #5 Rod down

Scudler 2-Block 20" Dia.

Synco BBS-11 Fine Wire Drawing Machine, Wet
dwg.

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A. T. HENRY & COMPANY, INC.

50 CHURCH ST., NEW YORK CITY 8

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1—8" DIAMETER x 10" FACE 2-HI COLD
MILL

1—5 ROLL ABRAMSON TUBE STRAIGHT-
ENER 3/4" to 3" O.D. Tube

1—SUTTON DOUBLE HEAD GAG
STRAIGHTENING PRESS 1 1/4" Ca-
pacity

1—12" x 1/4" STAMCO SHEAR

1—2000 HP G.E. SLIP RING MOTOR—
237 RPM 2300 V with Controls

ALBERT CURRY & COMPANY, INC.

3519-21 BEGLOW BOULEVARD, PITTSBURGH 13, PA.

SHEAR

#10 D.B.C. "BUFFALO"

DIAGONAL BAR CUTTER

Air Clutch, 20 Strokes/Min., 2 1/4" Stroke

Capacities:

Rd. Bars—3-15/16; Sq. Bars 3 1/2"

Angles—8 x 8 x 3/4; Beams—12"—41#

Flats—10 x 1 1/4 or 8 x 1 1/4

Presently Equipped to Cut All Sizes

of Channel from 3" — 4.1# to 12" — 30#

NEW 1955 — EXCELLENT CONDITION

LANG MACHINERY CO., INC.

28th ST. & A.V.R.R. PITTSBURGH 22, PA.

GRant 1-3594

24" x 28" Hendey Geared Head Lathe, M.D.
22 1/2" Centers.

62" King Vert. Boring Mill, R.H. Swivel Head,

L.H. Turret Hd., Side Hd., M.D.

5' x 3/16" Beloit Initial Bending Roll M.D.

645-D, 675-B Bliss Hi-Speed Press, Late Type.

600 Ton Southward Hyd. Inclined Wheel Press.

FALK MACHINERY COMPANY

16 Ward St., Baker 5-5887, Rochester 5, N. Y.

RAILWAY EQUIPMENT

FOR SALE

Used As-Is Reconditioned

RAILWAY CARS

All Types

SERVICE-TESTED

FREIGHT CAR REPAIR

PARTS

For All Types of Cars

LOCOMOTIVES

Diesel, Steam, Gasoline

Diesel-Electric

SPECIAL

STANDARD GAUGE CARS

COVERED HOPPER CARS

10-70 Ton Capacity

ORE HOPPER CARS

660 Cubic Feet

40- and 50-Ton Capacity

RAILWAY TANK CARS

and STORAGE TANKS

6,000- 8,000- and 10,000-Gallon

Cleaned and Tested

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IRON & STEEL PRODUCTS, INC.

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"ANYTHING containing IRON or STEEL"

Eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

PLAIN CYLINDRICAL GRINDERS

No. 5 Brown & Sharpe Plain, m.d., 1942

No. 20—10x18" cap. Brown & Sharpe Plain, m.d.

4x12" Landis Type H Knee Hole Type, m.d.

6x15" Cincinnati Plain Hydraulic, m.d.

6x18" Cincinnati Model EA, m.d.

6x18" Landis Type C Hydraulic, m.d., late

6x18" Norton Plain Grinder, m.d.

10x18" Cincinnati Plain Hydraulic, Model ER,

m.d., Filomatic Spindle, 1943

10x18" Cincinnati Model EA, m.d.

10x18" Norton Type C, m.d., latest

10x36" Cincinnati Hydraulic, m.d.

10x36" Norton Type C, m.d.

10x36" Landis Type CH Plain, m.d.

10x48" Cincinnati Model ER Plain Hydraulic,

m.d.

14x36" Landis Type C, 1945

16x94" Cincinnati Plain, m.d.

16x40"x120" Cincinnati Plain Heavy Duty, 1953

16"x120" Landis Type B Plain H.D. Hydraulic,

m.d., late

18"x36" Landis Type C, m.d.

18"x72" Norton Type C, mechanical, m.d..

23"x36" cc Norton Type C, m.d.

23"x72" cc Type C Norton Semi-Auto, Hydraulic

25"x72" Landis Type C, m.d.

42"x72" cc Norton, m.d.

HONE MACHINES

No. 3 Barnes Single Spindle Internal Hone, new

No. 182 Barnes Drill, m.d.

No. 854 Micromatic Vertical Honing Machine,

m.d.

H1 Micromatic Horizontal Hydrohoner, m.d.

H4 Micromatic Horizontal Hydrohoner, m.d.

No. 6 Barnes Twin Spindle

No. 306H Barnes Twin Spindle

No. 224H Barnes Honing Machine, m.d.

Model 4014C Barnes Self-Oiling Hydraulic Ver-

tical Model MA Sunnen Bench Type, m.d.

KEYSEATERS

Morton, m.d., thru reversing gear box

Taylor & Fenn Horizontal Shaving, Shaping

Keyseating, m.d., 1942

W-L-W Machine Keyseater, new

We carry on average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times

THE EASTERN MACHINERY COMPANY

1002 Tennessee Avenue, Cincinnati 29, Ohio

MEIrose 1241 "TWX" CI 174

CABLE ADDRESS—EMCO

ROLLING MILLS—STEEL WORKS EQUIPMENT

1—AUTOMATIC COOLING BED FOR BARS up to 2" dia. consists of run-in table, cascade section, shuffle bar section, runout table, with all electric, 200 ft. long.
1—21" x 52" x 77" TANDEM COLD REDUCTION MILL, 4-high, 3 stands.
1—18" x 43" x 42" TANDEM COLD REDUCTION MILL, 4-high, 3-stands.
1—15" x 30" x 31" 4-HIGH COLD MILL.
1—28" x 40" HOT STRIP MILL, 2-high, reversing, with 2500 HP D.C. motor generator, etc.
1—25" x 42" x 66" HOT STRIP MILL, 4-high.
1—28" PINION STAND, 2-high, modern design.
1—16 1/2" x 24" 2-HIGH, 4-STAND TANDEM COLD MILL, individual D.C. drive motors, take-up reel.
1—16" x 22" COLD MILL, 2-high.
1—8" x 10" COLD MILL including uncoiler, recoiler and edging rolls.
2—28 3-HIGH ROLL STANDS.
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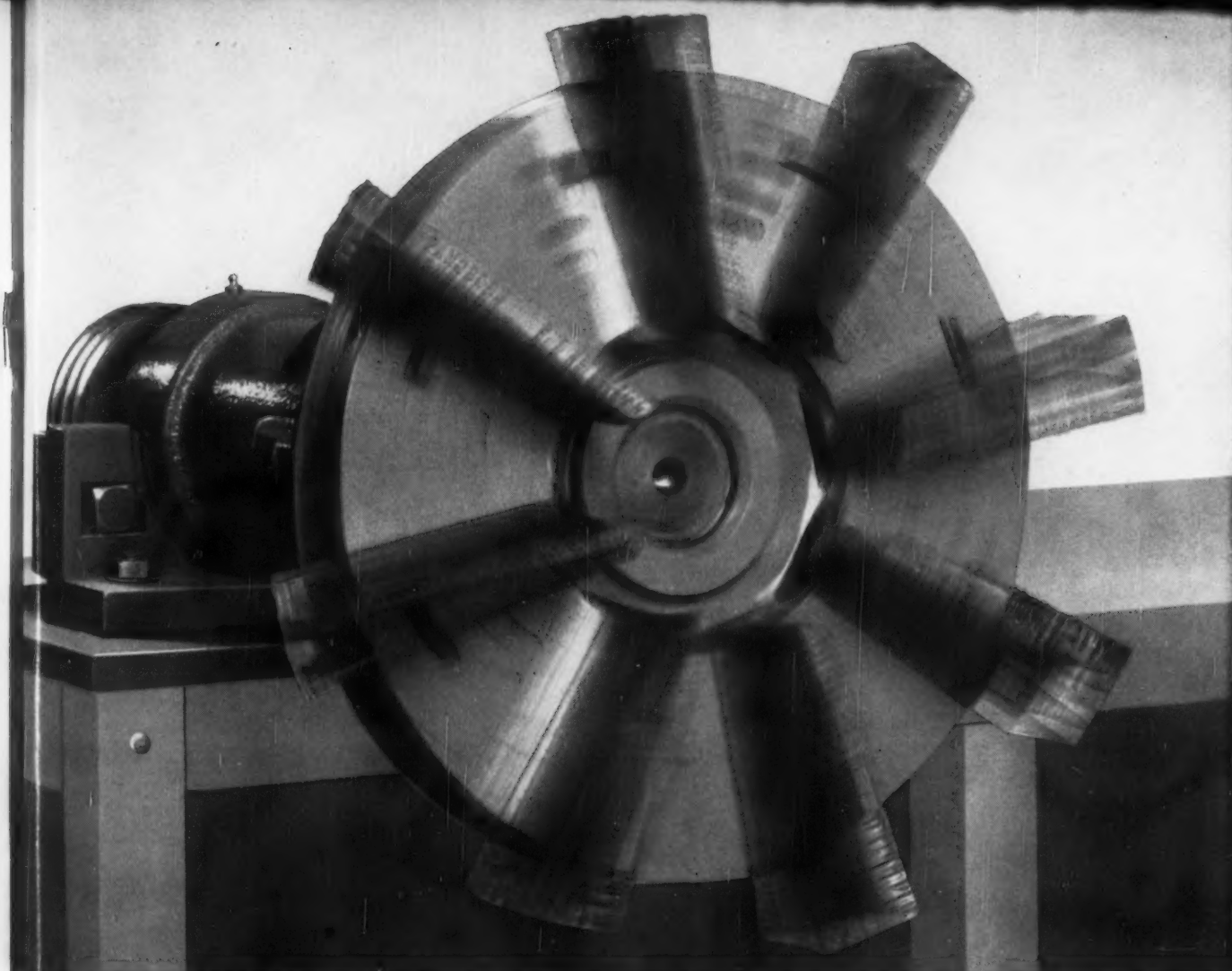


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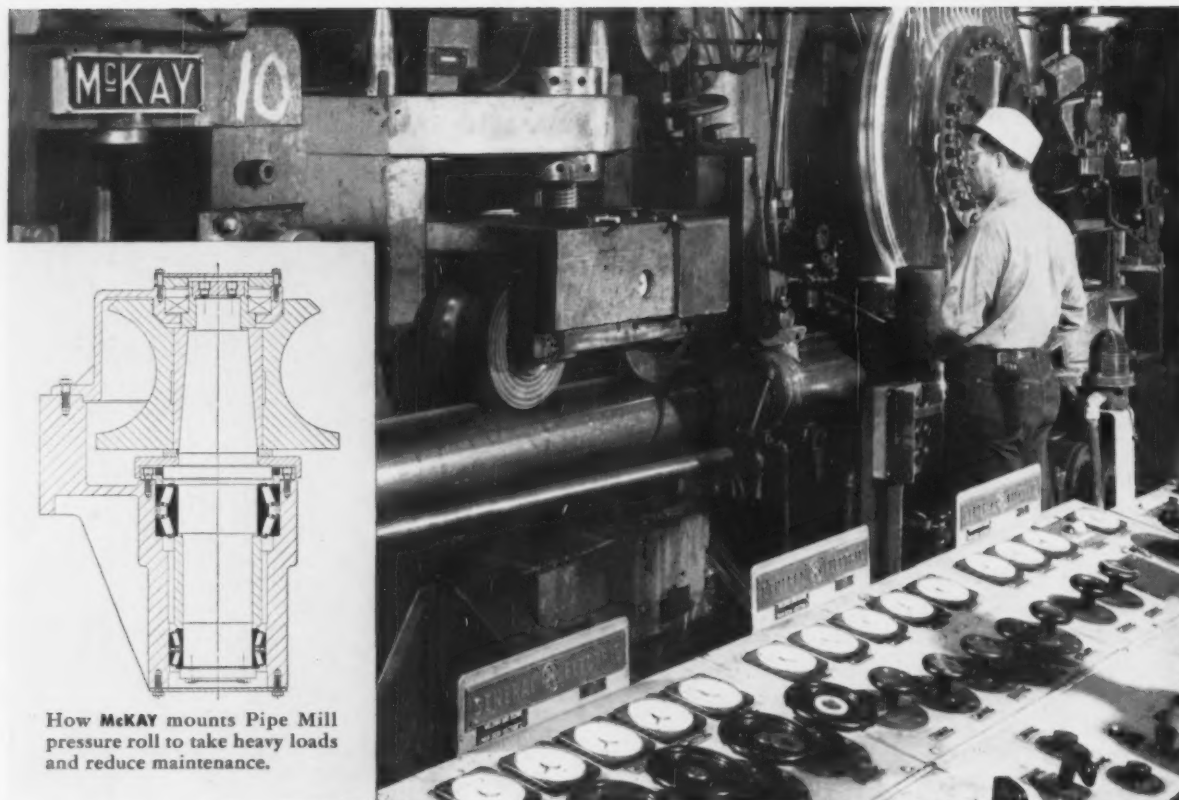
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